

SOCIAL AND PSYCHOLOGICAL DETERMINANTS OF VALUE CO-CREATION IN THE DIGITAL ERA

EDITED BY: Ricardo Martinez Cañas, Maria Angeles Garcia Haro,
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SOCIAL AND PSYCHOLOGICAL DETERMINANTS OF VALUE CO-CREATION IN THE DIGITAL ERA

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Editorial: Social and Psychological Determinants of Value Co-creation in the Digital Era

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Keywords: value co-creation, organizational outcomes, organizational contingencies, social determinants, psychological determinants

Editorial on the Research Topic

Social and Psychological Determinants of Value Co-creation in the Digital Era

Organizations in the twenty-first century continuously adapt their mindsets and look for new ways to reawaken employees' talent toward innovation and competitiveness. In this regard, they fulfill new environment requirements together with more effective and interactive competitive strategies such as: fostering cooperation, promoting relationships of resource/competencies exchange, and developing networks through communication platforms and virtualization. There is a constant transformation of administrative processes from isolated into interactive processes. Consequently, a more psychological and social approach is needed to understand the real value and combined outcomes experienced through value co-creation activities. For a better understanding, organizational studies should consider a holistic view of stakeholders and their context as co-creators of the key-value needed to excel and be competitive.

This Research Topic for Frontiers in Psychology brings together a set of contributions related to social and psychological determinants of value co-creation for organizations and individuals.

In a brief, value co-creation reflects the value created and experienced through collaboration between multiple stakeholders (Prahalad and Ramaswamy, 2000; Saarijärvi et al., 2013). This concept has become a paradigm shift highlighting joint outcomes of a service organization's interaction with stakeholders (Grönroos, 2017). Also, value co-creation is a mechanism of the business model that creates a unique strategic relationship (de Oliveira and Cortimiglia, 2017). Moreover, it can become the central focus of organizations wanting to create superior shared value (Merz et al., 2018). However, the outcomes are affected by diverse internal and external determinants such as, individual/group/organizational characteristics, expectations, degree of participation, and environment (Jaakkola et al., 2015; Hsieh and Chang, 2016). Understanding the influence of these factors and contingent situations allows companies to strategically leverage their interactions with key stakeholders.

Recent, systematic review of the topic identified three broad research perspectives: psychological elements of value co-creation, content and processes, and innovation results (Fan and Luo, 2020). The present Special Issue brings together 12 studies by 53 authors who analyzed value co-creation and its relevance to addressing gaps of these research perspectives.

In the first, related to psychological elements of value co-creation, the research question is: why do customers participate in co-creation? Therefore, is value co-creation related to psychological factors such as motivation and personal characteristics? In this Research Topic:

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Méndez-Aparicio et al. analyzed how customers' experience and satisfaction were related to value co-created with users of a private insurance corporation's web platform. Their empirical results showed that user's expectations were only relevant before web consumption.

Liu et al. explored the relationship between users' psychological contracts and their knowledge contribution in online health communities. Their results showed that users' transactional psychological contracts harmed their knowledge contribution directly and indirectly by weakening their community identification.

Carranza et al. studied how e-banking adoption could be an opportunity for customer value co-creation. Their results suggested that when e-banking customers had a positive attitude toward using e-banking they also had a greater intention to co-create and collaborate.

Hasan Al-kumaim et al. studied the role of sustaining continuous engagement through online platforms in value co-creation among individuals in universities. Their results proved that personal factors and perceived usefulness are motivational factors, however, the significance of these findings was contingent on individuals.

The second stream related to consumer processes is related to the question: how to carry out value co-creation?. The response includes activities on how to manage problems and elements in collaboration. In this Research Topic:

Siddique et al. theoretically studied customer engagement valence in a virtual service network. Their research analyzes how customer engagement's valence depends on the cognitive interpretation of positive signals (co-creating) and negative signals (co-destructing) prompted by multiple actors on a web store service network.

González-Santa Cruz et al. studied the internal marketing dimensions in cooperatives and social economy organizations. Their research about Ecuador's cooperative phenomenon highlighted the importance of providing quality service content to the external customer's characteristics and needs.

Garro-Abarca et al. analyzed virtual teams' role in times of pandemic, exploring factors that influence performance. Their paper groups the main elements into different models proposed by the literature and analyzes a study conducted amid the Covid-19 crisis on 317 software development teams. They found that communication processes are crucial to working in virtual teams, and also trust management is essential for leadership, empowerment, and cohesion.

Finally, in the research stream related to the impact results of value co-creation, variables related to innovation, engagement, loyalty, among other aspects, will have positive outcomes. In the Research Topic:

González-Torres et al. used a service-dominant logic perspective and a bibliometric analysis for analyzing the value co-creation effect of industrial clusters and global value chains. Their research remarked the critical change of these systems from the traditional isolated configuration to a more co-produced value chain structure with specialized interactive services.

Nájera-Sánchez et al. mapped value co-creation literature in the technology and innovation management field. They found eleven thematic groups and obtained significant research streams such as open innovation, consumer-centric analysis, service ecosystem, and service innovation. Also, they identified two new trends in literature: servitization and the sharing economy phenomenon.

Arroyave et al. analyzed the importance of universities' cooperation activities with different agents for building value co-creation systems for obtaining eco-innovations and improving firm performance. Using a sample of 250 companies in Spain, they found that value co-creation eased operational flexibility and generated environmental innovations and therefore increased the firm's sales and benefits.

Ortiz et al. studied the mediating role of realized absorptive capacity in the relationship between intra-organizational social capital and product innovation. Their results suggested that strong and tightly knit links based on a shared understanding and trust among company members lead the firm to develop dynamic capabilities.

Jiménez-Zarco et al. examined female micro-entrepreneurs and social networks for diagnostic analysis of social media marketing strategies' influence on brand financial performance. Using an online survey, they found that using social media tools in marketing actions significantly affects economic performance.

Given this selection of papers, we encourage researchers to draw their conclusions about value co-creation's complex phenomena. Our hope as editors of this Special Issue is that these different perspectives will encourage a prompt discussion among Journal Frontiers in Psychology readers.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

REFERENCES

- de Oliveira, D. T., and Cortimiglia, M. N. (2017). Value co-creation in web-based multisided platforms: a conceptual framework and implications for business model design. *Bus. Horizons* 60, 747–758. doi: 10.1016/j.bushor.2017.07.002
- Fan, X., and Luo, Y. (2020). Value co-creation: a literature review. *Open J. Soc. Sci.* 8, 89–98. doi: 10.4236/jss.2020.82008
- Grönroos, C. (2017). On value and value creation in service: a management perspective. *J. Creat. Value* 3, 125–141. doi: 10.1177/2394964317727196
- Hsieh, S. H., and Chang, A. (2016). The psychological mechanism of brand co-creation engagement. *J. Interact. Mark.* 33, 13–26. doi: 10.1016/j.intmar.2015.10.001
- Jaakkola, E., Helkkula, A., Aarikka-Stenroos, L., and Verleye, K. (2015). The co-creation experience from the customer perspective: its measurement and determinants. *J. Serv. Manag.* 26, 321–342. doi: 10.1108/josm-09-2014-0254
- Merz, M. A., Zaranonello, L., and Grappi, S. (2018). How valuable are your customers in the brand value co-creation process? The development of a customer co-creation value (CCCV) scale. *J. Bus. Res.* 82, 79–89. doi: 10.1016/j.jbusres.2017.08.018

Prahalad, C. K., and Ramaswamy, V. (2000). Co-opting customer competence. *Harv. Bus. Rev.* 78, 79–90.

Saarijärvi, H., Kannan, P. K., and Kuusela, H. (2013). Value co-creation: theoretical approaches and practical implications. *Euro. Bus. Rev.* 25, 6–19. doi: 10.1108/09555341311287718

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Visualizing Research on Industrial Clusters and Global Value Chains: A Bibliometric Analysis

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In the current digital era, the borders amongst firms are getting blurred when it comes to value creation. Therefore, the traditional configuration of the value chain is frequently replaced by other ones which include the collaborative participation of different agents. Within this context, global value chains, where the value activities are located in different countries, and industrial clusters, which combine competition and cooperation, are attracting a growing attention of both business leaders and scholars in the recent years. Through a bibliometric analysis, this paper disentangles the intellectual and conceptual structure of the research topic of industrial clusters and global value chains. Results show the multidisciplinary character of the topic, including papers published in different areas, such as business, regional studies and world development, as well as its close link with aspects like innovation, regional development, governance or organization. Finally, this study remarks the research lines that could attract more attention in the immediate future.

Keywords: global value chain, industrial cluster, bibliometric study, co-citation analysis, co-word analysis, Sci-mat, VOS-viewer

INTRODUCTION

From the seminal work of Prahalad and Ramaswamy (2000) and the proposal of a service-dominant logic presented by Vargo and Lusch (2004), many authors have worked in the field of value cocreation, giving birth to an abundant and varied literature (Ranjan and Read, 2016) which stems from overcoming a linear vision of value chains and value creation. From a value cocreation perspective, as stated by Ballantyne (2004), the traditional image of a supplier producing goods and services to be offered to the customers is replaced by an interactive process of learning together, where the participants integrate their resources and competencies to increase the creation of value in a service system (Vargo et al., 2008).

Different works have emphasized the relevance of the competitive and cooperative environment when it comes to empower value cocreation. Ngongoni and Grobbelaar (2017) studied how the participation of external agents spurred value cocreation in an entrepreneurial ecosystem. Rupó et al. (2018) studied an Italian maritime cluster from different perspectives, including value cocreation. Finally, Crick et al. (2020) analyzed the importance of competitor orientation in a wine cluster to foster enhanced value cocreation activities. Thus, from a service-dominant logic,

industrial clusters and global value chains can be good examples of the rupture of the traditional linear supplier–customer relationship.

Industrial clusters enable companies to specialize in their core business by providing them with a wider network of specialized suppliers and providers, skilled workers and business associations (Giuliani et al., 2005), enabling the integration of resources and competencies. A cluster or industrial district requires geographic proximity and sectorial concentration of organizations in order to seek complementarities that allow them to generate competitive advantages (Porter, 1990, 2000). However, the production of products and services is increasingly seen as a process that takes place where the necessary resources are available in a competitive manner, both in terms of cost and quality. In this context, the approach of the global value chain arises as a tool enabling the consideration of the operations developing outside the cluster and the key role of relations with the most relevant external agents (Gereffi, 1999; Giuliani et al., 2005).

Industrial clusters and global value chains have attracted the interest of both business leaders and scholars in different disciplines. Academic research has grown rapidly because these strategies are increasingly considered as potential ways to enhance firm competitiveness in international markets (Giuliani et al., 2005). Considering the expansion of the field in recent years, the need for a systematic review of the existing literature arises.

In order to fill this gap, the main goal of this article is to provide a review of research on industrial clusters and global value chains. Accordingly, the specific objectives are the following: (1) to assess the productivity, impact and relative influence of the research topic; (2) to present the intellectual structure; (3) to identify the thematic organization and (4) to identify the conceptual structure. According to these goals and following recent bibliometric reviews, we can also settle the following research questions (González-Torres et al., 2020):

- RQ1: What is the historical evolution of the literature of industrial clusters and global value chains?
- RQ2: Which are the most productive journals addressing industrial clusters and global value chains?
- RQ3: Who are the most productive authors addressing industrial clusters and global value chains?
- RQ4: Which are the most prominent documents in the field of industrial clusters and global value chains?
- RQ5: Which are the main documents that have influenced the intellectual structure of the topic industrial clusters and global value chains?
- RQ6: Which are the main journals around which the research topic of industrial clusters and global value chains is organized?
- RQ7: What are the top subjects and topics in the field of industrial clusters and global value chains?

In order to answer these questions, a qualitative and quantitative analysis was performed using a bibliometric methodological approach, following other relevant works (Gomezeli, 2016; Marasco et al., 2018). Bibliometric analysis

helps scholars draw useful conclusions about a specific research field by analyzing citations, co-citations and word frequency, among others. The appropriate bibliometric method has been chosen to encompass a broad picture of the literature (see Table 1).

Firstly, we have used the software Sci-mat (Cobo et al., 2012). This software allows us to apply evaluative techniques of academic productivity and impact metrics. Thus, productivity is measured according to the historical evolution of published articles, the distribution of articles by journal or book and individual author. Academic impact or influence is analyzed according to the total number of citations of the most cited articles.

In addition to evaluative techniques, relational techniques are applied. Following a bibliometric mapping approach through the VOS-Viewer software (Van Eck and Waltman, 2010) it is possible to detect the structure of the research topic. These results are presented in the form of visual networks through co-citation analysis —articles and journals— and co-words.

The main contribution of this article is to provide a synthesis of the body of research on industrial clusters and global value chains. Accordingly, we address the academic impact of the topic through diverse evaluative techniques of academic productivity and impact metrics. Finally, by using different relational techniques, we offer insights about the intellectual structure, thematic organization and conceptual structure of the subject. The relevance of this article lies in the importance of the research topic, which offers diverse challenging issues and research opportunities for many academic disciplines, gathering the interest of researchers mainly concerned about business management, development studies, and corporate social responsibility.

The organization of the article is the following: section “Theoretical Framework” provides a theoretical overview of the topic. In section “Materials and Method,” we explain the data collection and bibliometric methods used. Next section addresses the results of the evaluative and relational techniques. Finally, in the fifth and sixth sections, the main findings are presented, in the form of discussion, conclusions, limitations, and future research lines.

THEORETICAL FRAMEWORK

According to Morosini (2004, p. 307), an industrial cluster is a “*socioeconomic entity characterized by a social community of people and a population of economic agents localized in close proximity in a specific geographic region. Within an industrial cluster, a significant part of both the social community and the economic agents work together in economically linked activities, sharing and nurturing a common stock of product, technology and organizational knowledge in order to generate superior products and services in the marketplace.*” Being part of a cluster offers a wide range of potential benefits for businesses (Rodríguez-Sánchez, 2020). The main advantages are related to efficiency thanks to the division and specialization of the workforce, as well as the availability of qualified and trained workers. Moreover,

TABLE 1 | Bibliometric methodology.

Objective	Research questions	Bibliometric method	Analysis	Software
(1) To assess academic impact and relative influence	RQ1: Historical evolution literature	Evaluative techniques: Productivity Assessment	Historical evolution of documents	Sci-Mat
	RQ2: Most productive journals		Distribution of documents by journal	
	RQ3: Most productive authors		Distribution of documents by author	
	RQ4: Most prominent documents	Evaluative techniques: Impact metrics	Citation analysis	
(2) To determine intellectual structure	RQ5: Main documents influencing intellectual structure	Relational techniques: co-citation	Co-citation analysis: documents Co-citation analysis: authors Co-citation analysis: journals	VOS -Viewer
(3) To identify thematic organization	RQ6: Main journals around which the research topic of is organized			
(4) To identify conceptual structure	RQ7: Patterns and hot topics	Relational techniques: co-occurrence	Co-word analysis	

from the perspective of external stakeholders, industry clusters give access to a broader range of providers and suppliers, to agents selling in national and international markets, and encourages the creation of business associations (Giuliani et al., 2005).

The capability of clustered firms to grow and be efficient has attracted great interest among scholars. However, the current globalization of markets and the widespread use of information and communication technologies (ICT) have transformed production process, distribution and sales systems, financial markets and even human talent retention (Schmitz and Nadvi, 1999; Kaplinsky and Gereffi, 2001; Rodríguez-Sánchez et al., 2020). The production of products and services is increasingly seen as a process that takes place where the necessary resources and capabilities are available in a competitive manner, both in terms of cost and quality (OECD, 2020). Accordingly, special focus should be given to external relationships, since the growing importance of export-oriented industrialization has made necessary for firms to integrate into a global economy (Gereffi and Kaplinsky, 2001).

In this context, the approach of the global value chain arises as a tool enabling the consideration of the operations developing outside the cluster and the key role of relations with the most relevant external agents (Gereffi, 1999; Giuliani et al., 2005; Lensen et al., 2012). The notion of value chain proposed by Porter (1990) helps to understand cost behavior and sources of differentiation and by disaggregating the company into its strategic activities. In addition, Porter (1990) highlights that the firm's value chain is integrated into a broader flow of activities called the value system. While traditional approaches are limited to manufacturing, the value chain perspective broadens the focus to complementary activities in the production and provision of value-adding products and services, including distribution and marketing (Wood, 2001; Giuliani et al., 2005). Accordingly, it could be said that the vision of the value chain helps researchers to understand the characteristics and quality of the relationships between value chain agents (Humphrey and Schmitz, 2002).

Stemming from the basic notion of value chain and taking into account that firms are increasingly locating the different phases of the production process in different territories for competitive reasons, the concept of global value chain helps to understand how global production and distribution systems are organized (Humphrey and Schmitz, 2002). In this regard, for many industries, access to international markets means entering networks of international and diverse partners in areas such as design, production, and marketing (Gereffi and Kaplinsky, 2001).

From a service-dominant logic, as Ranjan and Read (2016), the final value is not necessarily created in a co-production activity, but also through the use of the product (value in use). As Alves et al. (2016) state, value co-creation takes place when the resources of one service system integrate with those belonging to another one. This is a typical situation in both clusters and global value chains, where value creation and knowledge acquisition are empowered by the interaction of the different agents (Martínez-Cañas et al., 2012), prominently suppliers, customers and competitors of both.

MATERIALS AND METHODS

In order to provide a rigorous, transparent and reproducible synthesis of the literature, this article develops the method called systematic review (Gomezelj, 2016). The most suitable documents were chosen according to a process that allows to identify existing research, to examine the value and relevance of the research topic and, finally, to collect independent works (even with opposite results) and to summarize their implications (Becheikh et al., 2006).

For the information search, we have used Web of Science (WoS) bibliographic database, which is one of the most relevant in the field of Social Sciences, in particular in business and economics. In addition, this database is commonly used in bibliometric studies in the fields of management and organization (Dzikowski, 2018).

In order to choose the publications to include in the systematic review and to exclude the subjectivity of the researchers in the data collection, we have followed a keyword search of the literature.

Articles, proceedings papers, book chapters and reviews published in peer-reviewed journals were the result of the keyword search in the WoS database. The following were the keywords: 'industrial clusters,' 'industrial districts,' and 'global value chains.' The search took into consideration works published from 1900 to January 2020, according to **Table 2**. The total number of documents was 246. After the filtering process, a total of 155 documents were selected.

RESULTS

This section describes the results found in the sample of documents analyzed on current research in industrial clusters and global value chains. Firstly, evaluative techniques are presented in Section "Bibliometric Evaluative Techniques," including measures of productivity and impact metrics as citation analysis. Secondly, Section "Bibliometric Relational Techniques" focuses on relational techniques, as the co-citation analysis and the co-word analysis.

Bibliometric Evaluative Techniques

The academic impact and relative influence of research on industrial clusters and global value chains is measured through the use of evaluative techniques. Accordingly, productivity is assessed based on the historical evolution of publications, the distribution of articles by journal or book and also by individual author (Ospina-Mateus et al., 2019). In addition, the most cited documents allows us to evaluate the impact or relative influence of the topic (Hall, 2011). These techniques were developed using SciMAT software.

Productivity Assessment

Figure 1 shows the total number of documents published in the field of study for the period 1990 to January 2019.

The first publication within these topic appeared in 2002 in the Journal of Regional Studies (Humphrey and Schmitz, 2002). The highest peak of publications took place in 2018 ($n = 25$). The figure shows the presence of a growing interest in the topic, though the pace of publications is not steady, with some periods of shortage, remarkably the years 2013–2015. Two different reasons can explain this situation. On the one hand, the impact of special issues, or books like the one edited by De Marchi et al. (2017b), is important in shaping the academic production pace, as they gather the participation of some of the most prominent authors and research teams. On the other hand, we can state that this field is relatively young, and some irregularities can be expected in this kind of topics, as Lange et al. (2011) proved for another then young topic, the study of corporate reputation.

All these 155 documents were included in 98 publications. Particularly, 81 of them (83%) published one paper; 9 (9%) published 2 papers; and 8 publications (8%) included more than 2

documents. Journals with more than three articles on the research topic are listed in **Table 3**.

Apart from the monography referred in **Table 3**, six journals have gathered 47 articles, which means around one third of the ones finally included in the revision. We can find some communalities between these journals, such as being high quality publications, included in the first quartile of the Journal of Citation Report (JCR), or using mostly a regional or geographical approach. Nevertheless, we can distinguish between *economics* journals, such as World Development or the Journal of Economic Geography; and *business and management* journals, like the Journal of Business Ethics or Competition and Change. This distinction will also be present in the analysis of the keywords used by the authors.

There is a total of 276 authors for the 155 selected documents. It should be highlighted that the highest share of authors (87.7%; $n = 242/276$) is related to a single publication, and 12.3% ($n = 34/276$) is attributed to two or more publications. Based on the total number of publications, **Table 4** presents the most productive authors—more than two articles—. P.Lund-Thomsen is the most productive author.

The most prolific authors in this field of study are aligned with three different concerns. Lund-Thomsen is especially concerned by corporate social responsibility, analyzing in different papers the ethical impacts of offshoring activities related with industrial clusters of developing countries. Though the inclusion of industrial clusters located in developing countries in global value chains has been defended as a potential source of economic progress for local agents, the different scandals that have aroused reveal the need for both compliance policies and CSR concerns, driven by local agents, multinational companies linked with the clusters, external organizations or all of them. Lund-Thomsen has analyzed the role of these different agents in the design and development of actions and governance policies in order to address this problem through different papers, using mainly a case study analysis approach, as well as carrying out different reviews of the state of the art.

Di Maria, in turn, has analyzed the decisions made by companies included in a cluster when choosing between relying on local supply networks and national or international ones, comparing them with the options taken by non-cluster companies. So, the tension between local and global approaches is present along her work, analyzing the conditioning factors behind this decision. To do so, she used a mainly quantitative approach, originally based on one large database of Italian firms.

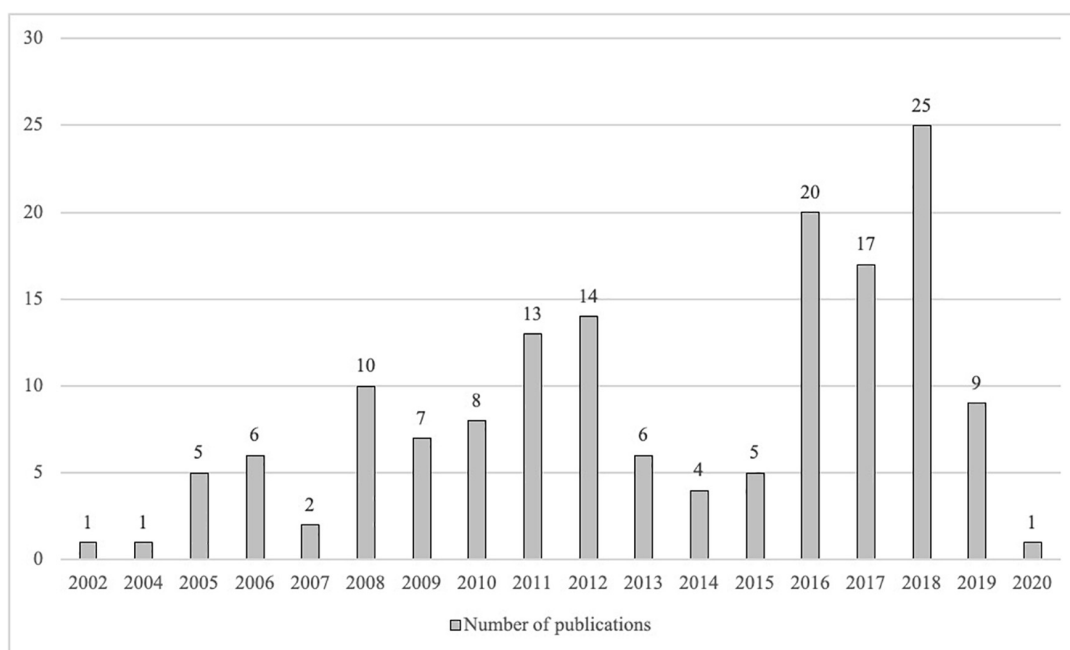
Finally, Belussi has considered the impact of global value chains on traditional industrial clusters. From her point of view, the globalization of the economy has an obvious impact on local industrial districts, which will be successful in their integration in global value chains if the firms included in them are able to learn and assume new activities beyond manufacturing. The approach used to analyze this situation uses mainly case studies.

Impact Assessment: Citation Analysis

The most prominent documents in a research area are those with the highest levels of citations. Thus, citation analysis allows us to detect the influence of certain documents on a particular topic

TABLE 2 | Data collection.

Database	Web of Science (WoS)
Geographical range	Global scientific production
Features	JCR impact factor Immediacy index Citations Quartile
Search criteria	Topic
Inclusion criteria	Article Proceedings paper Book chapter Review
Time frame	All years to 2020
Search date	15 January 2020
Keywords	TS = (industrial cluster* OR industrial district* AND global value chain*)
Initial documents	246
Refinement	Business Economics Management
Final documents	155
	Duplicated documents No author Not topic related

**FIGURE 1 |** Historical evolution of publications.

(Merigó et al., 2016). **Table 5** shows the documents with the highest number of citations in absolute terms.

The most cited paper was published in the Journal of Regional Studies 18 years ago. This work, that gave birth to this research topic, Humphrey and Schmitz (2002), is the most cited one both in absolute (843 cites) and relative (46,83 cites per year) terms.

This paper can be considered the seminal work of the main research stream inside this topic: the upgrading of local clusters through their inclusion in global value chains and environments. The relevance of this specific line, mainly related with the balance between regional development and globalization, is so clear that at least four of the five top cited articles address it. The concern about ethics and CSR is also present in most of these articles.

Bibliometric Relational Techniques

The relational bibliometric techniques — co-citation and co-word analysis— allow the structure of the research topic to be

defined according to the main themes and topics discussed (Zupic and Čater, 2015). There are other relational techniques such as co-authorship and bibliographic coupling, which are not suitable for this article considering the limited number of documents and the forward-looking approach of the study. A bibliometric mapping tool — VOS-Viewer software— is used to provide a visual overview of the analysis (Van Eck and Waltman, 2010).

Intellectual Structure and Thematic Organization: Co-citation Analysis

Co-citation analysis enables the identification of interrelated influential works and, consequently, the intellectual structure and thematic organization of a research topic. Two elements are co-cited when they are cited together in another article, which means that there is a thematic similarity and affinity between them. Depending on the unit of analysis, several types of citations are applied in this article: document co-citation; author

TABLE 3 | Distribution of articles by journal or book and impact factor.

Journal	Documents	Impact Factor (2018)/ Categories
Entrepreneurship and Regional Development	12	2,928 (JCR) Development Studies (Q1) Business (Q2)
Local clusters in global value chains: linking actors and territories through manufacturing and innovation	9	Book
Regional Studies	8	3,074 (JCR) Economics (Q1) Geography (Q1) Environmental Studies (Q2) Regional and Planning (Q2)
Journal of Business Ethics	8	3,796 (JCR) Business (Q1) Ethics (Q1)
World Development	7	3,905 (JCR) Development Studies (Q1) Economics (Q1)
Journal of Economic Geography	5	3,359 (JCR) Economics (Q1) Geography (Q1)
Competition and Change	4	0,793 (SJRI) Business, Management and Accounting (miscellaneous) (Q1)

co-citation; and journal or source co-citation (Small, 1973; White and McCain, 1998; Shafique, 2013).

The document co-citation allows the identification of the studies on industrial clusters and global value chains that are most frequently cited together (Small, 1973). Of the 155 documents selected, we have identified 7,226 references cited. Of this total, 21 met the minimum threshold of 15 citations per article. As can be seen in **Figure 2**, the largest group is composed of 9 elements. The dots or nodes illustrate the references, the larger the number of citations per document, the larger the node size. The links between the nodes represent co-citation relations. The strength of the link is illustrated by the thickness of the link. According to the association strength normalization method used by the VOS-Viewer, we have found three clusters.

Being their previous works more than relevant precedents, we can place Humphrey and Schmitz (2002) and Gereffi et al. (2005) papers in the very origin of the studies about the upgrading of clusters through their participation in global value chains. Some of the most prominent papers in this topic are co-authored by them, and the work of the teams in which they participate is clearly a must when it comes to the analysis of this business trend.

These authors reached the study of the role of local clusters in global value chains starting from different points. The previous publications of Gereffi, frequently cited in the topic, deal with the transformations experimented by commodity chains, pushed towards globalization due to the demand of the buyers (buyer-driven commodity chains). Therefore, the integration of local clusters in these dynamics was a topic to be

boarded. Schmitz, in turn, developed previous research about local industrial clusters placed in developing countries, analyzing the conditions that could foster their growth. Probably, the most important one is precisely their inclusion in global supply chains. So, either starting from the study of the globalization of the supply chains or stemming from the upgrading of local clusters, the topic analyzed in this paper appears as a logical meeting point.

The green cluster includes some basic references in business management about competitiveness, such as Porter (1990), or case study methodology, mainly Eisenhardt (1989), which is frequently used as foundations of many papers not necessarily dealing with this topic.

Regarding the author co-citation (White and Griffith, 1981), the 155 documents selected included 4,590 cited authors. Of this total, 54 met the minimum threshold of 20 citations per author (see **Figure 3**).

The red cluster encompasses 23 authors, who mainly address basic literature related to the competitiveness of different types of agglomerations (industrial districts, clusters, etc.). Innovation is stressed among the relevant drivers of success studied by the authors (e.g., Giuliani, 2007). In addition, it is highlighted the role of the learning process and knowledge creation as another key source of competitive advantage in industrial clusters (e.g., Maskell and Malmberg, 1999; Maskell, 2001). It is especially relevant to stress the contribution of G. Becattini (52 citations), who after the seminal approaches to industrial districts (Marshall, 1923), rediscovered this form of organization as a socio-territorial entity (e.g., Becattini, 1990, 2004). It should also be highlighted the reference to the work of M. Porter (102 citations), who is the world's leading authority on competitive advantage. The studies of Porter examine the competitiveness of firms and industries in global markets, and what drives the economy of an entire country (e.g., Porter, 1990, 2008).

The green cluster comprises 18 items, and it includes the authors with the highest number of citations, like Gereffi G. (198 citations), Humphrey (140 citations), and Schmitz H. (119 citations). This group is focused on the analysis of value chains potentiality in internationalized and global contexts (e.g., Gereffi and Kaplinsky, 2001). The study of Humphrey and Schmitz (2002) deserves to be mentioned because of its relevance – among the 140 citations of Humphrey, 83 come from these work. This is a key research since it addresses how the integration in global value chains impacts on the enhancement of industrial clusters, which can be considered one of the cornerstones of this research topic, as stated before.

Finally, the blue cluster encompasses 13 authors and combines the topic of industrial clusters and global value chains. The most prominent author is Belussi F. (90 citations), who focuses his research on the Italian industrial clusters (e.g., Belussi, 2003; Belussi and Sedita, 2009). Mudambi addresses the tracking and tracing of diverse stages of the value chain depending on the results to be obtained (e.g., Mudambi, 2008; Mudambi and Venzin, 2010). Finally, both Belussi F. and Hervás-Oliver J.L. (33 citations) pay special attention to the generation and diffusion of knowledge (e.g., Belussi, 2003) and the particular dynamics of multinational

TABLE 4 | Distribution of articles by individual author.

Author	Title	Journal	JCR Impact Factor (2018)/ Categories	Year	Docs.
Lund-Thomsen and Nadvi, 2010b	Global value chains, local collective action and corporate social responsibility: a review of empirical evidence	Business Strategy and the Environment	6,381 (JCR) Business (Q1) Management (Q1) Environmental Studies (Q1)	2010	8
Lund-Thomsen and Nadvi, 2010a	Clusters, chains and compliance: Corporate social responsibility and governance in football manufacturing in South Asia	Journal of Business Ethics	3,796 (JCR) Business (Q1) Ethics (Q1)	2010	8
Lund-Thomsen and Pillay, 2012	CSR in industrial clusters: An overview of the literature	Corporate Governance: The International Journal of Business in Society	0,43 (SJIR) Business, Management and Accounting (miscellaneous) (Q2)	2012	8
Lund-Thomsen et al., 2016b	Special issue on industrial clusters and corporate social responsibility in developing countries	Journal of Business Ethics	3,796 (JCR) Business (Q1) Ethics (Q1)	2016	8
Pyke and Lund-Thomsen, 2016	Social upgrading in developing country industrial clusters: A reflection on the literature	Competition and Change	0,793 (SJIR) Business, Management and Accounting (miscellaneous) (Q1)	2016	8
Lund-Thomsen et al., 2016a	Industrial clusters and corporate social responsibility in developing countries: What we know, what we do not know, and what we need to know	Journal of Business Ethics	3,796 (JCR) Business (Q1) Ethics (Q1)	2016	8
Fayyaz et al., 2017	Industrial clusters and CSR in developing countries: the role of international donor funding	Journal of Business Ethics	3,796 (JCR) Business (Q1) Ethics (Q1)	2017	8
Gulati et al., 2018	Cluster matters: corporate social responsibility and micro, small and medium-sized enterprise clusters in India	Research Handbook on Small Business Social Responsibility	Book		8
Bettiol et al., 2008	Networks, technologies and globalization processes in SMEs: the Italian case	European Conference on Information Management and Evaluation	Conference	2008	7
Chiarvesio and Di Maria, 2009	Internationalization of supply networks inside and outside clusters	International Journal of Operations and Production Management	4,111 (JCR) Management (Q1)	2009	7
Bettiol et al., 2017	Industrial District Firms Do Not Smile: Structuring the Value Chain between Local and Global	Breaking up the Global Value Chain: Opportunities and Consequences	Book	2017	7
De Marchi et al., 2017c	New frontiers for competitiveness and innovation in clusters and value-chains research	Local Clusters in Global Value Chains	Books	2017	7
De Marchi et al., 2017a	Industrial districts, clusters and global value chains: toward an integrated framework.	Local Clusters in Global Value Chains	Book	2017	7
Bettiol et al., 2018b	Manufacturing, where art thou? Value chain organization and cluster-firm strategies between local and global	Local Clusters in Global Value Chains	Book	2018	7
Bettiol et al., 2018a	Does It Pay to Be International? Evidence from Industrial District Firms	Contemporary Issues in International Business	–	2018	7

(Continued)

TABLE 4 | Continued

Author	Title	Journal	JCR Impact Factor (2018)/ Categories	Year	Docs.
Sammarra and Belussi, 2006	Evolution and relocation in fashion-led Italian districts: evidence from two case-studies	Entrepreneurship and Regional Development	2.928 (JCR) Development Studies (Q1) Business (Q2)	2006	5
Belussi, 2011	The new Marshallian districts and their process of internationalization	Handbook of regional innovation and growth	Book	2011	5
Belussi and Sedifa, 2012a	18 Multiple Path Dependency and Creativity in Industrial Districts	Managing Networks of Creativity	–	2012	5
Belussi and Sedifa, 2012b	Industrial districts as open learning systems: Combining emergent and deliberate knowledge structures	Regional Studies	3.074 (JCR) Economics (Q1) Geography (Q1) Environmental Studies (Q2) Regional and Urban Planning (Q2)	2012	5
Belussi et al., 2017	MNEs and clusters: The creation of place-anchored value chains	Local Clusters in Global Value Chains	Book	2017	5

enterprises (MNEs) (e.g., Hervás-Oliver and Albors-Garrigos, 2008; Hervás-Oliver and Boix-Domenech, 2013).

The journal co-citation allows the identification of the journals publishing on industrial clusters and global value chains that are most frequently cited together (McCain, 1990). The journal research areas are similar when they are frequently cited together. Of the 155 documents selected, we have identified 3,621 journals cited. Of this total, 20 met the minimum threshold of 63 citations per source. As shown in **Figure 4**, the gap between two journals represents their relatedness in terms of co-citation linkages. The most relevant co-citation links are also illustrated with thicker lines.

The previous analysis of the most prolific journals showed that, though the concern about regional development was always present, two different perspectives (the economic and the management ones) could be addressed. This relational analysis can help us to shed a closer light over this issue. According to the similarity method used by VOS-Viewer, we have identified three clusters.

The red cluster comprises journals related to the areas of Business, management, organization and strategy (e.g., Research Policy, Strategic Management Journal, etc.). So, the topics of these publications are mainly related with the opportunities for additional value creation that global value chains generate for the firms included in industrial districts. This cluster is, so, closely linked with the study of value cocreation.

The green cluster basically focuses on relevant research in economic geography as well as local and regional development (Regional Studies, Journal of Economic Geography). The main concerns of these publications are linked with the economic impact of a new industrial configuration, rebalancing the value creation between local and global tensions.

Finally, the blue cluster consists of a more varied set of journals (Journal of Business Ethics, World Development, etc...) that focus their research on economic policies and business organization, and their impact on the wellness of communities and individuals. The main considerations about the actions that both firms and governments should implement in order to protect workers and other stakeholders are addressed by these journals.

Conceptual Structure: Co-word Analysis

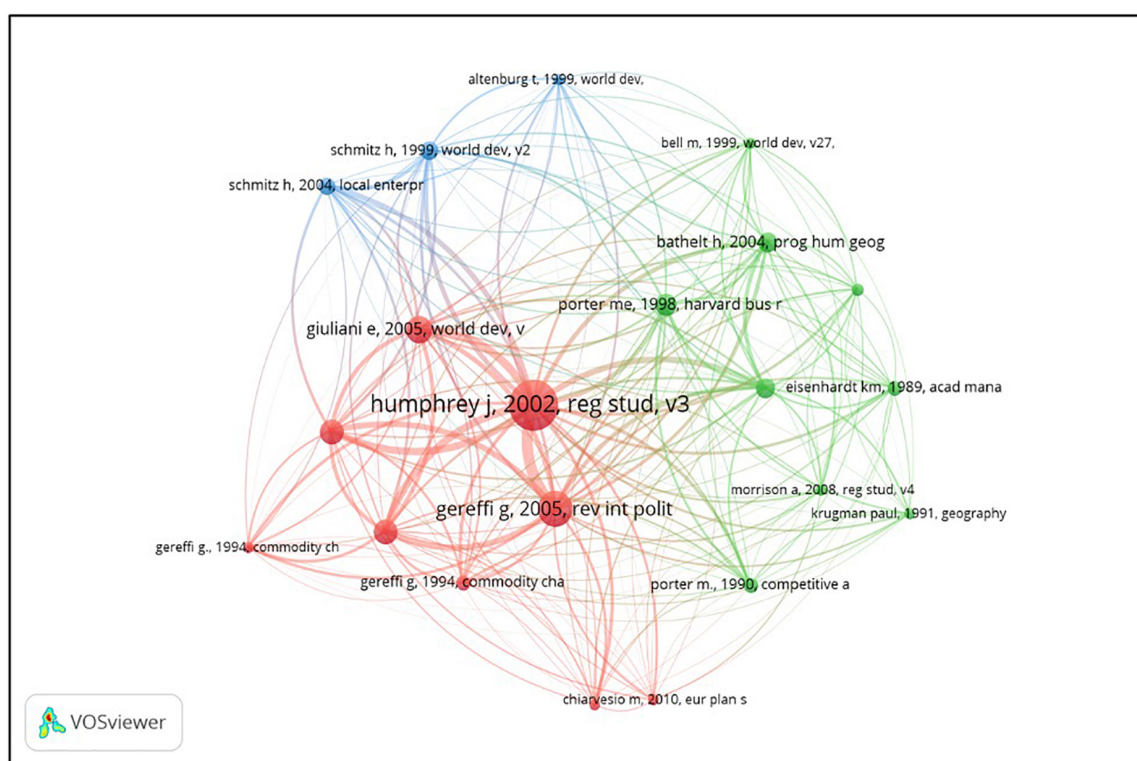
Research trends and hot topics emerge from the co-word analysis of the most frequent keywords (Li et al., 2016). As can be seen in **Figure 5**, in our sample of 155 documents, we have detected 682 keywords. We have only considered the keywords that appear in at least 8 publications. The nodes illustrate the occurrence of the keywords, the greater the weight of an element, the larger the node size. The links between the nodes represent the number of times that the keywords occur together. The strength of the link is illustrated by the thickness of the link.

The main keywords in the research topic are “global value chains” (70 occurrences and 247 total link strength), “innovation” (39 occurrences and 177 total link strength) and “clusters” (41 occurrences and 170 total link strength). So, it could be said that industrial clusters and global value chain seem to be to be

TABLE 5 | The top five most cited documents.

R	Title	Author/s	Journal	Impact Factor (2018)/	Year	TC	C/Y
1	How does insertion in global value chains affect upgrading in industrial clusters?	Humphrey and Schmitz, 2002	Regional Studies	3,074 (JCR) Economics (Q1) Geography (Q1) Environmental Studies (Q2)	2002	843	46,8
2	Upgrading in global value chains: lessons from Latin American clusters	Giuliani et al., 2005	World Development	3,905 (JCR) Development Studies (Q1) Economics (Q1)	2005	363	24,2
3	Clusters, connectivity and catch-up: Bollywood and Bangalore in the global economy	Lorenzen and Mudambi, 2013	Journal of Economic Geography	3,359 (JCR) Economics (Q1) Geography (Q1)	2013	140	20,0
4	Beyond strategic coupling: reassessing the firm-region nexus in global production networks	MacKinnon, 2012	Journal of Economic Geography	3,359 (JCR) Economics (Q1) Geography (Q1)	2012	157	19,6
5	The changing global geography of low-technology, labor-intensive industry: clothing, footwear, and furniture	Scott, 2006	World Development	3,905 (JCR) Development Studies (Q1) Economics (Q1)	2006	114	8,1

R, rank; TC, total citations; C/Y, citations per year.

**FIGURE 2 |** Co-citation of documents in the field of industrial clusters and global value chains.

a hot topic, with different research lines being developed from these core concepts.

The node, “global value chains,” has stronger links with “industrial clusters,” “clusters” and “networks.” This node ties in closely with “innovation,” “governance” and “knowledge” which is obvious considering that all of them determinants of competitive advantage, and so linked with the business management perspective which was remarked when analyzing the main journals. The node “innovation,” also belonging to this red cluster of keywords, is closely related to “global value chains,” “industrial districts,” “industrial clusters,” “clusters”; “networks”

and “knowledge,” remarking the innovative spillover effect of clusters and global value chains.

The map also shows the other two concerns stated before. The blue cluster can be associated with the institutional and organizational regulation of the new shapes of value systems. Therefore, words like “governance,” “industrial clusters,” or “organization” are prominent and deeply related to each other. Finally, the green cluster of keywords can be linked with the geopolitical analysis, being “globalization,” “global value chain,” and “firms” the most frequent ones, showing links with “regional development” or “global production networks.” The relatively

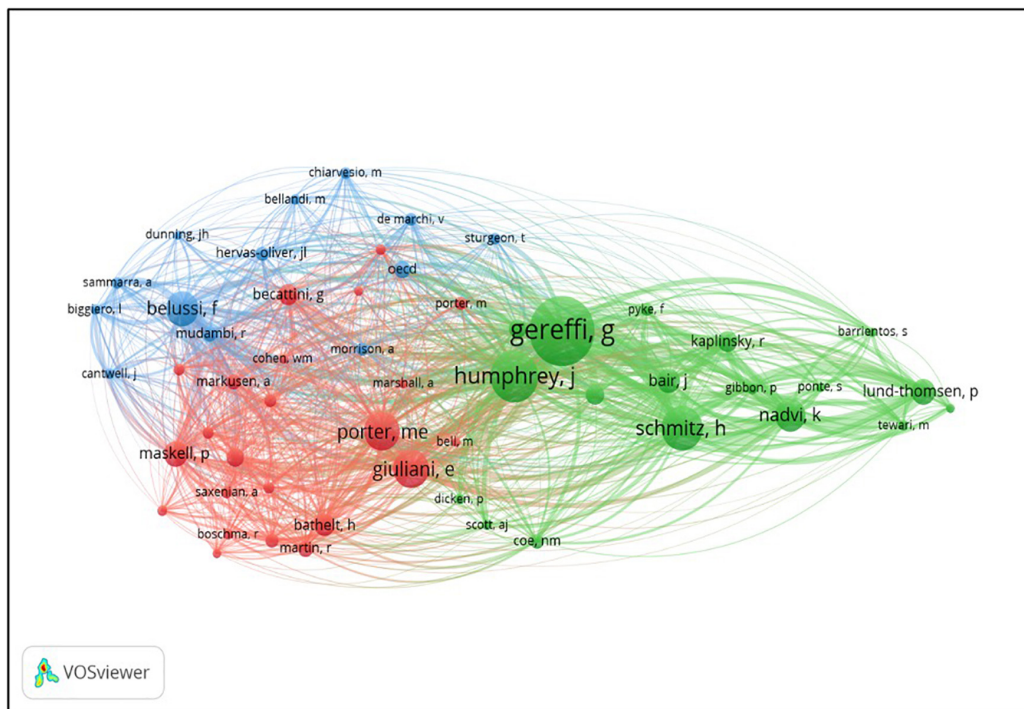


FIGURE 3 | Co-citation of individual authors in the field of industrial clusters and global value chains.

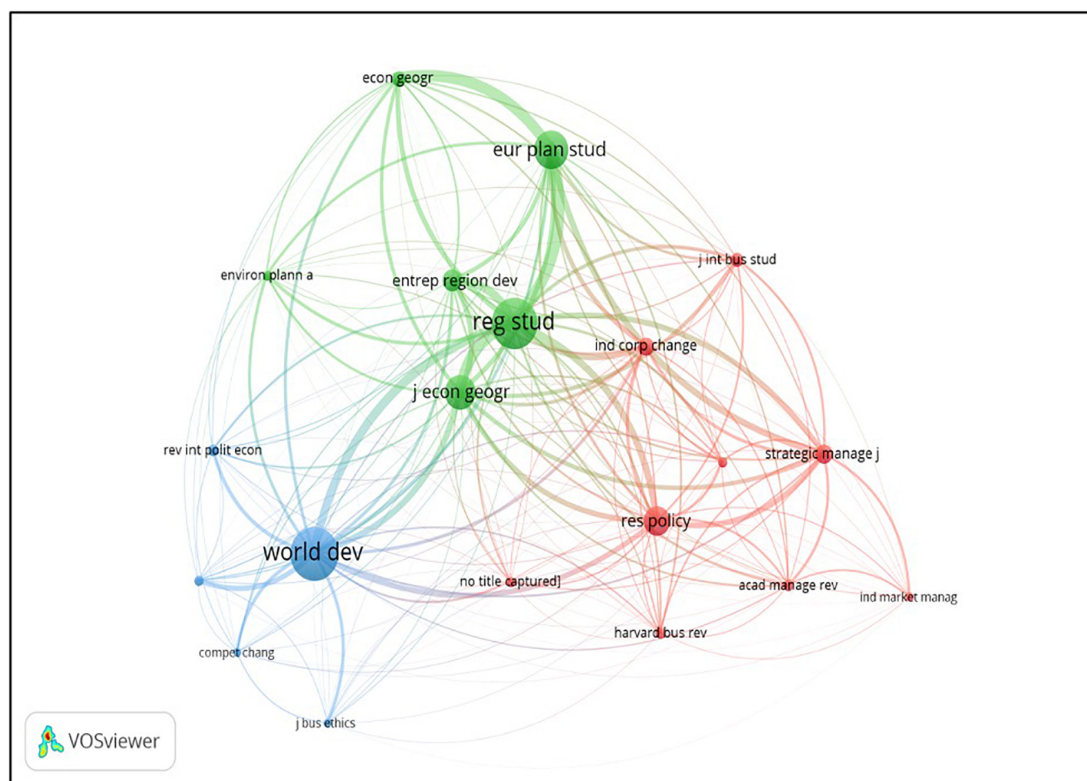


FIGURE 4 | Co-citation of sources or journals in the field of industrial clusters and global value chains.

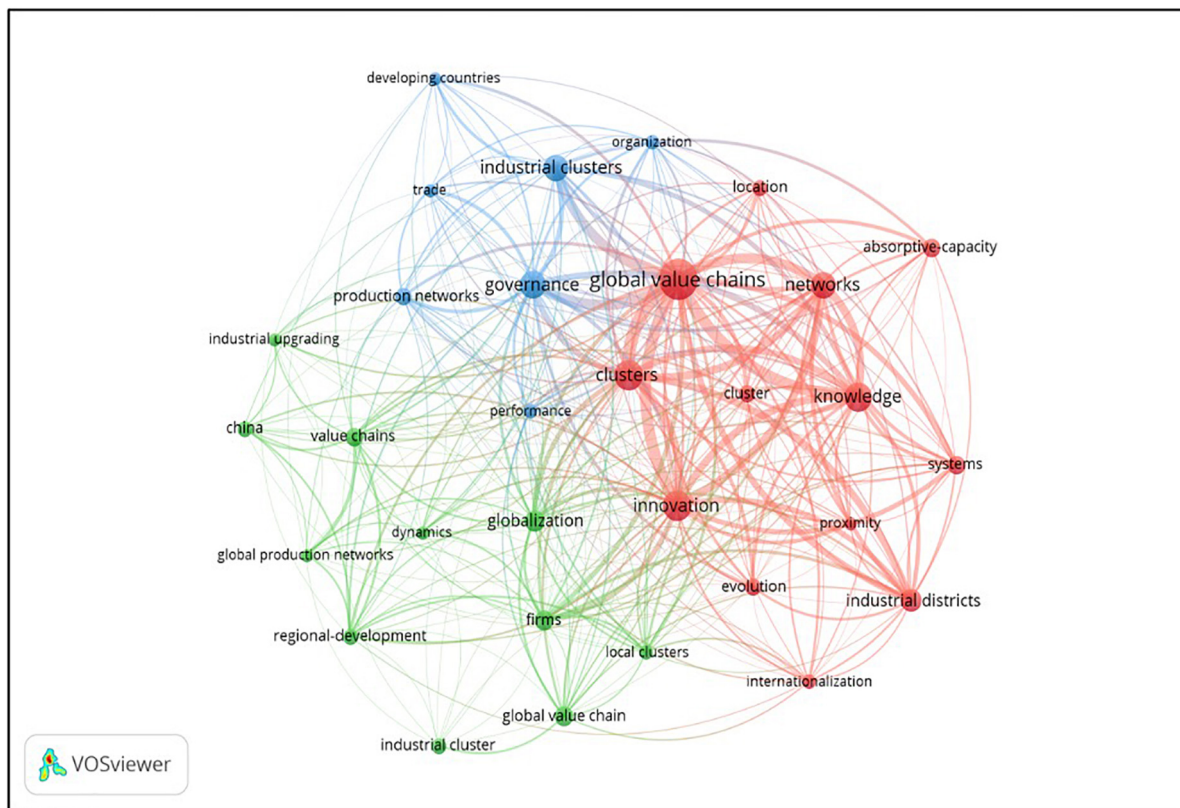


FIGURE 5 | Co-occurrence network of keywords in the field of industrial clusters and global value chains.

lower presence of these keywords could point at a relatively higher potential for further development of these kind of studies.

As can be seen, industrial clusters and global value chains remain an emerging research field that requires additional investigation and discussion. An interesting development of this study will probably be to separate bibliometric analysis into 5-year stages. Considering the limited number of publications and their concentration in recent years, this is not possible at present.

DISCUSSION AND CONCLUSION

The traditional configuration of a value system composed by independent companies working isolatedly is less frequent every day. From a service-dominant logic, value is not created along different independent steps, but through the co-production and the value in use of different agents involved in a service system (Ranjan and Read, 2016).

Industrial clusters have been studied as a productive combination of competition and cooperation amongst companies related with a specific activity (Giuliani et al., 2005), creating an adequate environment for value cocreation (Crick et al., 2020). Nevertheless, clusters had always been mainly rooted to the ground, anchored to a specific location. Different studies, amongst which Humphrey and Schmitz (2002) must be highlighted, proposed that the inclusion of

these industrial districts into global value chains (Gereffi, 1999; Giuliani et al., 2005) could result into their upgrade, generating additional opportunities of value creation.

This article aims to provide a summary of research on industry clusters and global value chains through a systematic review taking into account the previously published literature. Through a bibliometric analysis, this paper disentangles the intellectual and conceptual structure of the joint research of the topics of industrial clusters and global value chains.

The results show that we are facing an interesting topic that has been able to capture a high degree of attention of the academic community in less than 20 years. Starting from the seminal work of Humphrey and Schmitz (2002), still the most cited one in this research field, the evolution of the number of publications along this time reveals a clearly growing interest, despite of the classical sawtooth of relatively young research streams.

The original research question, which is the main concern of some of the most cited articles, deals with how to upgrade the potential of industrial clusters integrating them into global value chains (Humphrey and Schmitz, 2002; Giuliani et al., 2005). This original concern immediately leads the studies in two complementary directions: its effect over the firm competitiveness, especially related with business management; and its impact on regional development, potentially modifying the balance between local and global tendencies. Additionally, a third main research line has aroused, specially fueled by

the works of the most prolific author in the field, Lund-Thomsen, dealing with the ethical aspects that should be addressed by local agents when cooperating with partners established abroad, that have to be approached by institutional policies and corporate governance.

The presence of these three main intertwined research lines can be seen along the results drawn by all the techniques used in our bibliometric analysis. The most productive journals are related with these areas, especially with regional development; the authors and articles cited can be closely linked with their theoretical and empirical foundations; and the keywords used by the different authors are some of the most familiar terms in these literatures.

Probably, the main limitation of the paper derives from the necessary selection of documents to be analyzed. Though the database chosen, WoS, gathers the majority of the most prominent publications in this research stream, some relevant studies could be potentially not included in it. Also, even if it is not frequent, some of the documents analyzed may not include keywords, which could slightly modify the results of the co-work analysis. Finally, due to the nature of this kind of analyses, the interpretation of the different maps is unavoidably subjective.

The relative youth of the topic has also put some limits to the analyses carried out. For instance, it is still not possible to distinguish different periods in the research of this field, as long as the majority of the scientific production belongs to the latest years. So, if the literary production continues to increase, and the production measurements clearly point at that possibility, it will be interesting to carry out a new study in some years in order to analyze the possible evolution of the stream of research. This is clearly one of the future research lines concerning clusters and global value chains, as well as a deep literary review that can shed an additional light on this literature.

Behind the entire topic, no matter the specific focus we consider, we can find the tension between local and global tendencies. The integration of clusters in global value chains

has created an opportunity to balance both opposite trends, generating different issues to be analyzed and solved, present in different ways in the papers included in this analysis. Nevertheless, we can never say that this upgrading is the ultimate, or even the best, synthesis of both.

The burst of the crises of COVID-19 has put again this debate on the table. Are the countries generating an excessive external dependence when it comes to key industries? Or is, in turn, the solution to the crisis closer to higher levels of international cooperation and integration? The answers given to these questions will, in turn, decisively influence the decisions and behavior of the economic agents, leading to new breakeven points which can be closer to one or the other, local or global, end.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

TG-T: conceptualization, methodology, and supervision. TG-T and J-LR-S: writing—original draft preparation. AM-N and RG-L: writing—review and editing. RG-L and J-LR-S: visualization. AM-N: project administration. J-LR-S, TG-T, AM-N, and RG-L: validation. TG-T and AM-N: formal analysis. RG-L: resources. All authors contributed to the article and approved the submitted version.

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REFERENCES

- Alves, H., Fernandes, C., and Raposo, M. (2016). Value co-creation: concept and contexts of application and study. *J. Bus. Res.* 69, 1626–1633. doi: 10.1016/j.jbusres.2015.10.029
- Ballantyne, D. (2004). Dialogue and its role in the development of relationship specific knowledge. *J. Bus. Ind. Mark.* 19, 114–123. doi: 10.1108/08858620410523990
- Becattini, G. (1990). “The Marshallian industrial district as a socio-economic notion,” in *Industrial Districts and Inter-firm Co-operation in Italy*, eds F. Pyke, G. Becattini, and W. Sengenberger (Geneva: International Institute for Labour Studies), 37–51.
- Becattini, G. (2004). *Industrial Districts: a New Approach to Industrial Change*. Cheltenham: Edward Elgar Publishing.
- Becheikh, N., Landry, R., and Amara, N. (2006). Lessons from innovation empirical studies in the manufacturing sector: a systematic review of the literature from 1993–2003. *Technovation* 26, 644–674.
- Belussi, F. (2003). “The generation of contextual knowledge through communication processes. The case of the packaging machinery industry in the Bologna district,” in *The Technological Evolution of Industrial Districts*, eds F. Belussi, G. Gottardi, and E. Rullani (Boston, MA: Springer), 341–365. doi: 10.1007/978-1-4615-0393-4_15
- Belussi, F. (2011). “The new Marshallian districts and their process of internationalization,” in *Handbook of Regional Innovation and Growth*, eds P. Cooke, B. Ashemi, R. Boschma, R. Martin, D. Schwartz, and F. Todtling (Cheltenham: Edward Elgar Publishing), 90–102.
- Belussi, F. (2011). “The new Marshallian districts and their process of internationalization,” in *Handbook of Regional Innovation and Growth*, eds P. Cooke, B. Asheim, R. Boschma, R. Martin, D. Schwartz, and F. Todtling (Cheltenham: Edward Elgar Publishing).
- Belussi, F., Caloffi, A., and Sedita, S. R. (2017). “MNEs and clusters: the creation of place-anchored value chains,” in *Local Clusters in Global Value Chains*, eds V. De Marchi, E. Di Maria, and G. Gereffi (London: Routledge), 85–107.
- Belussi, F., Caloffi, A., and Sedita, S. R. (2017). “MNEs and clusters: the creation of place-anchored value chains,” in *Local Clusters in Global Value Chains: Linking Actors and Territories Through Manufacturing and Innovation*, eds V. De Marchi, E. Di Maria, and G. Gereffi (Abingdon: Routledge).
- Belussi, F., and Sedita, S. R. (2009). Life cycle vs. multiple path dependency in industrial districts. *Eur. Plan. Stud.* 17, 505–528. doi: 10.1080/09654310802682065
- Belussi, F., and Sedita, S. R. (2012a). 18 multiple path dependency and creativity in industrial districts. *Manag. Netw. Creat.* 19:317.

- Belussi, F., and Sedita, S. R. (2012b). Industrial districts as open learning systems: combining emergent and deliberate knowledge structures. *Reg. Stud.* 46, 165–184. doi: 10.1080/00343404.2010.497133
- Bettiol, M., Burlina, C., Chiarvesio, M., and Di Maria, E. (2017). Industrial district firms do not smile: structuring the value chain between local and global. *Adv. Int. Manag.* 30, 269–291. doi: 10.1108/s1571-502720170000030011
- Bettiol, M., Burlina, C., Chiarvesio, M., and Di Maria, E. (2018a). “Does it pay to be international? evidence from industrial district firms,” in *Contemporary Issues in International Business*, eds D. Castellani, R. Narula, Q. Nguyen, I. Surdu, and J. Walker (Cham: The Academy of International Business).
- Bettiol, M., Burlina, C., Chiarvesio, M., and Di Maria, E. (2018b). “Manufacturing, where art thou? Value chain organization and cluster-firm strategies between local and global,” in *Local Clusters in Global Value Chains*, eds V. De Marchi, E. Di Maria, and G. Gereffi (Abingdon: Taylor &).
- Bettiol, M., Chiarvesio, M., and Di Maria, E. (2008). “Networks, technologies and globalisation processes in SMEs: the Italian case,” in *Proceeding of ECIME 2008 The 2nd European Conference on Information Management and Evaluation*, (Royal Holloway: University of London), 41–50.
- Chiarvesio, M., and Di Maria, E. (2009). Internationalization of supply networks inside and outside clusters. *Int. J. Operat. Prod. Manag.* 29:11. doi: 10.1108/01443570911000186
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., and Herrera, F. (2012). SciMAT: a new science mapping analysis software tool. *J. Am. Soc. Inform. Sci. Technol.* 63, 1609–1630. doi: 10.1002/asi.122688
- Crick, J. M., Crick, D., and Tebbett, N. (2020). Competitor orientation and value co-creation in sustaining rural New Zealand wine producers. *J. Rural Stud.* 73, 122–134. doi: 10.1016/j.jrurstud.2019.10.019
- De Marchi, V., Di Maria, E., and Gereffi, G. (2017a). “Industrial districts, clusters and global value chains: toward an integrated framework,” in *Local Clusters in Global Value Chains*, eds V. De Marchi, E. Di Maria, and G. Gereffi (London: Routledge), 1–18. doi: 10.4324/9781315182049-1
- De Marchi, V., Di Maria, E., and Gereffi, G. (2017b). “Linking actors and territories through manufacturing and innovation,” in *Local Clusters in Global Value Chains*, eds V. De Marchi, E. Di Maria, and G. Gereffi (London: Routledge), 19–32.
- De Marchi, V., Di Maria, E., and Gereffi, G. (2017c). “New frontiers for competitiveness and innovation in clusters and value-chains research,” in *Local Clusters in Global Value Chains*, eds V. De Marchi, E. Di Maria, and G. Gereffi (London: Routledge), 213–225. doi: 10.4324/9781315182049-12
- Dzikowski, P. (2018). A bibliometric analysis of born global firms. *J. Bus. Res.* 85, 281–294. doi: 10.1016/j.jbusres.2017.12.054
- Eisenhardt, K. M. (1989). Building theories from case study research. *Acad. Manag. Rev.* 14, 532–550. doi: 10.5465/amr.1989.4308385
- Fayyaz, A., Lund-Thomsen, P., and Lindgreen, A. (2017). Industrial clusters and CSR in developing countries: the role of international donor funding. *J. Bus. Ethics* 146, 619–637. doi: 10.1007/s10551-015-2940-6
- Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *J. Int. Econ.* 48, 37–70. doi: 10.1016/s0022-1996(98)00075-0
- Gereffi, G., Humphrey, J., and Sturgeon, T. (2005). The governance of global value chains. *Rev. Int. Polit. Econ.* 12, 78–104.
- Gereffi, G., and Kaplinsky, R. (2001). Introduction: globalisation, value chains and development. *IDS Bull.* 32, 1–8. doi: 10.1111/j.1759-5436.2001.mp32003001.x
- Giuliani, E. (2007). The selective nature of knowledge networks in clusters: evidence from the wine industry. *J. Econ. Geogr.* 7, 139–168. doi: 10.1093/jeg/lbl014
- Giuliani, E., Pietrobelli, C., and Rabellotti, R. (2005). Upgrading in global value chains: lessons from Latin American clusters. *World Dev.* 33, 549–573. doi: 10.1016/j.worlddev.2005.01.002
- Gomezeli, D. O. (2016). A systematic review of research on innovation in hospitality and tourism. *International J. Contemp. Hosp. Manag.* 28, 516–558. doi: 10.1108/ijchm-10-2014-0510
- González-Torres, T., Rodríguez-Sánchez, J. L., Pelechano-Barahona, E., and García-Muñoz, F. E. (2020). A systematic review of research on sustainability in mergers and acquisitions. *Sustainability* 12:513. doi: 10.3390/su12020513
- Gulati, M., Lund-Thomsen, P., and Suresh, S. (2018). “Cluster matters: corporate social responsibility and micro, small and medium-sized enterprise clusters in India,” in *Research Handbook on Small Business Social Responsibility*, eds
- L. Spence, J. Frynas, J. Muthury, and J. Navare (Chentelham: Edward Elgar Publishing), 77–100. doi: 10.4337/9781784711825.00011
- Hall, C. M. (2011). Publish and perish? Bibliometric analysis, journal ranking and the assessment of research quality in tourism. *Tour. Manag.* 32, 16–27. doi: 10.1016/j.tourman.2010.07.001
- Hervas-Oliver, J. L., and Albors-Garrigos, J. (2008). Local knowledge domains and the role of MNE affiliates in bridging and complementing a cluster's knowledge. *Entrepren. Reg. Dev.* 20, 581–598. doi: 10.1080/08985620802462231
- Hervas-Oliver, J. L., and Boix-Domenech, R. (2013). The economic geography of the meso-global spaces: integrating multinationals and clusters at the local-global level. *Eur. Plan. Stud.* 21, 1064–1080. doi: 10.1080/09654313.2013.733853
- Humphrey, J., and Schmitz, H. (2002). How does insertion in global value chains affect upgrading in industrial clusters? *Reg. Stud.* 36, 1017–1027. doi: 10.1080/0034340022000022198
- Kaplinsky, R., and Gereffi, G. (2001). The value of value chains: spreading the gains from globalisation. *Spec. Issue IDS Bull.* 32, 1–8.
- Lange, D., Lee, P. M., and Dai, Y. (2011). Organizational reputation: a review. *J. Manag.* 37, 153–184.
- Lensen, G., Van Wassenhove, L., Pickard, S., Lenssen, J. J., Lund-Thomsen, P., and Pillay, R. G. (2012). CSR in industrial clusters: an overview of the literature. *Corp. Govern.* 12:4.
- Li, H., An, H., Wang, Y., Huang, J., and Gao, X. (2016). Evolutionary features of academic articles co-keyword network and keywords co-occurrence network: based on two-mode affiliation network. *Phys. A Stat. Mech. Appl.* 450, 657–669. doi: 10.1016/j.physa.2016.01.017
- Lorenzen, M., and Mudambi, R. (2013). Clusters, connectivity and catch-up: bollywood and Bangalore in the global economy. *J. Econ. Geogr.* 13, 501–534. doi: 10.1093/jeg/lbs017
- Lund-Thomsen, P., Lindgreen, A., and Vanhamme, J. (2016a). Industrial clusters and corporate social responsibility in developing countries: what we know, what we do not know, and what we need to know. *J. Bus. Ethics* 133, 9–24. doi: 10.1007/s10551-014-2372-8
- Lund-Thomsen, P., Lindgreen, A., and Vanhamme, J. (2016b). Special issue on industrial clusters and corporate social responsibility in developing countries. *J. Bus. Ethics* 133, 5–8. doi: 10.1007/s10551-014-2371-9
- Lund-Thomsen, P., and Nadvi, K. (2010a). Clusters, chains and compliance: corporate social responsibility and governance in football manufacturing in South Asia. *J. Bus. Ethics* 93, 201–222. doi: 10.1007/s10551-010-0561-7
- Lund-Thomsen, P., and Nadvi, K. (2010b). Global value chains, local collective action and corporate social responsibility: a review of empirical evidence. *Bus. Strat. Environ.* 19, 1–13. doi: 10.1002/bse.670
- Lund-Thomsen, P., and Pillay, R. G. (2012). CSR in industrial clusters: an overview of the literature. *Corp. Govern.* 12, 568–578. doi: 10.1108/14720701211267874
- MacKinnon, D. (2012). Beyond strategic coupling: reassessing the firm-region nexus in global production networks. *J. Econ. Geogr.* 12, 227–245. doi: 10.1093/jeg/lbr009
- Marasco, A., De Martino, M., Magnotti, F., and Morvillo, A. (2018). Collaborative innovation in tourism and hospitality: a systematic review of the literature. *Int. J. Contemp. Hosp. Manag.* 30, 2364–2395. doi: 10.1108/ijchm-01-2018-0043
- Marshall, A. (1923). *Industry and Trade*, 4th Edn. London, UK: Macmillan.
- Martínez-Cañas, R., Sáez-Martínez, F. J., and Ruiz-Palomino, P. (2012). Knowledge acquisition's mediation of social capital-firm innovation. *J. Knowl. Manag.* 16, 61–76. doi: 10.1108/13673271211198945
- Maskell, P. (2001). Towards a knowledge-based theory of the geographical cluster. *Ind. Corp. Change* 10, 921–943. doi: 10.1093/icc/10.4.921
- Maskell, P., and Malmberg, A. (1999). Localised learning and industrial competitiveness. *Cambridge J. Econ.* 23, 167–185. doi: 10.1093/cje/23.2.167
- McCain, K. W. (1990). Mapping authors in intellectual space: a technical overview. *J. Am. Soc. Inform. Sci.* 41, 433–443. doi: 10.1002/(sici)1097-4571(199009)41:6<433::aid-asil1>3.0.co;2-q
- Merigó, J. M., Cancino, C. A., Coronado, F., and Urbano, D. (2016). Academic research in innovation: a country analysis. *Scientometrics* 108, 559–593. doi: 10.1007/s11192-016-1984-4
- Morosini, P. (2004). Industrial clusters, knowledge integration and performance. *World Dev.* 32, 305–326. doi: 10.1016/j.worlddev.2002.12.001

- Mudambi, R. (2008). Location, control and innovation in knowledge-intensive industries. *J. Econ. Geogr.* 8, 699–725. doi: 10.1093/jeg/lbn024
- Mudambi, R., and Venzin, M. (2010). The strategic nexus of offshoring and outsourcing decisions. *J. Manag. Stud.* 47, 1510–1533. doi: 10.1111/j.1467-6486.2010.00947.x
- Ngongoni, C. N., and Grobbelaar, S. S. S. (2017). “Value co-creation in entrepreneurial ecosystems: learnings from a Norwegian perspective,” in 2017 IEEE AFRICON (Institute of Electrical and Electronic Engineers: Cape Town), 707–713. doi: 10.1109/AFRCON.2017.8095569
- OECD (2020). *Global Value Chains (GVCs)*. Paris: OECD.
- Ospina-Mateus, H., Quintana Jiménez, L. A., Lopez-Valdes, F. J., and Salas-Navarro, K. (2019). Bibliometric analysis in motorcycle accident research: a global overview. *Scientometrics* 121, 793–815. doi: 10.1007/s11192-019-03234-5
- Porter, M. E. (1990). *The Comparative Advantage of Nations*. New York, NY: Free Press.
- Porter, M. E. (2000). Location, competition, and economic development: local clusters in a global economy. *Econ. Dev. Q.* 14, 15–34. doi: 10.1177/089124240001400105
- Porter, M. E. (2008). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York, NY: Simon and Schuster.
- Prahalad, C. K., and Ramaswamy, V. (2000). Co-opting customer competence. *Harvard Bus. Rev.* 78, 79–90.
- Pyke, F., and Lund-Thomsen, P. (2016). Social upgrading in developing country industrial clusters: a reflection on the literature. *Compet. Change* 20, 53–68. doi: 10.1177/1024529415611265
- Ranjan, K. R., and Read, S. (2016). Value co-creation: concept and measurement. *J. Acad. Mark. Sci.* 44, 290–315. doi: 10.1007/s11747-014-0397-2
- Rodríguez-Sánchez, J. L. (2020). Acciones necesarias para mejorar la relación causa-efecto entre la inversión en prácticas de gestión de recursos humanos y la motivación en la empresa. *Inform. Tecnol.* 31, 207–220.
- Rodríguez-Sánchez, J. L., González-Torres, T., Montero-Navarro, A., and Gallego-Losada, R. (2020). Investing time and resources for work–life balance: the effect on talent retention. *Int. J. Environ. Res. Publ. Health* 17:1920. doi: 10.3390/ijerph17061920
- Rupo, D., Perano, M., Centorrino, G., and Vargas-Sanchez, A. (2018). A framework based on sustainability, open innovation, and value cocreation paradigms: a case in an Italian maritime cluster. *Sustainability* 10:729.
- Sammarra, A., and Belussi, F. (2006). Evolution and relocation in fashion-led Italian districts: evidence from two case-studies. *Entrep. Reg. Dev.* 18, 543–562.
- Schmitz, H., and Nadvi, K. (1999). Industrial clusters in developing countries—clustering and industrialization: introduction. *World Dev.* 27, 1503–1514.
- Scott, A. J. (2006). The changing global geography of low-technology, labor-intensive industry: clothing, footwear, and furniture. *World Dev.* 34, 1517–1536.
- Shafique, M. (2013). Thinking inside the box? Intellectual structure of the knowledge base of innovation research (1988–2008). *Strategic Manag. J.* 34, 62–93.
- Small, H. (1973). Co-citation in the scientific literature: a new measure of the relationship between two documents. *J. Am. Soc. Inform. Sci.* 24, 265–269.
- Van Eck, N., and Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics* 84, 523–538.
- Vargo, S. L., and Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *J. Mark.* 68, 1–17.
- Vargo, S. L., Maglio, P. P., and Akaka, M. A. (2008). On value and value co-creation: a service systems and service logic perspective. *Eur. Manag. J.* 26, 145–152.
- White, H. D., and Griffith, B. C. (1981). Author cocitation: a literature measure of intellectual structure. *J. Am. Soc. Inform. Sci.* 32, 163–171.
- White, H. D., and McCain, K. W. (1998). Visualizing a discipline: an author co-citation analysis of information science, 1972–1995. *J. American Society for Inf Sci.* 49, 327–355. doi: 10.1002/(SICI)1097-4571(19980401)49:4<327::AID-ASIA>3.0.CO;2-4
- Wood, A. (2001). Value chains an economist’s perspective. *IDS Bull.* 32, 41–45.
- Zupic, I., and Čater, T. (2015). Bibliometric methods in management and organization. *Organ. Res. Methods* 18, 429–472.

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Analysis of the Internal Marketing Dimensions in Social Economy Organizations: Study Applied to Co-operativism in Ecuador

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Internal marketing involves the development of organizational strategies that promote the welfare of the employees who, in turn, play a transcendental role in achieving institutional goals. Ecuadoran co-operativism lacks relevant studies of this construct and, because of this, this research intends to analyze the dimensions of internal marketing, through the validation of a measuring instrument that has been adapted to this sector of the social economy, in a developing country. The methodology is based on the completion of field work, where a structured questionnaire for a representative sample of 2,499 employees and officers of the operatives of Ecuador was applied. The suitability of the scale was determined through the means of a model of Ecuadoran structural equations. The results show that internal marketing is a multi-dimensional construct and it can be measured in six dimensions: Identify Value Exchange (IVE), Internal Market Segmentation (IMS), Internal Communication (IC), Management Concern (MC), Training (TR), and Work/Family Balance (WFB).

Keywords: internal marketing dimensions, co-creation of value, measuring scale, co-operatives, Ecuador

INTRODUCTION

A globalized economy requires all the businesses, including co-operatives that are constantly restructuring to adapt to changes in the environment (Puusa et al., 2016); therefore, direct their efforts to human talent in order to improve their internal management. Taking into account that human capital is a resource that is difficult to imitate due to competition, it has thus become an important factor for organizational success (Teixeira, 2014). In this sense, Bailey et al. (2016) confirm that internal marketing should be considered as a strategy where the employees are involved in the goals of the organization and, thus, feel satisfied with the work done. For their part, González et al. (2016) consider that a committed employee actively contributes to the achievement of institutional goals. In this sense, research indicates that internal marketing is a serious alternative for increasing the employee's commitment to the organization and the subsequent satisfaction of the customer (Ali, 2016; Therasa et al., 2017).

Currently, internal marketing is a concept that continues to evolve to show the importance that relationships between employees and the organization have (Brahmah, 2016; Park and Tran, 2018; Vieira-dos Santos and Goncalves, 2018). In this case, diverse authors (among others,

Ruiz-Alba, 2013; Ruizalba et al., 2015; Mainardes et al., 2019) have defined it as the effort by the company to know, analyze, understand, and respond to the needs of its internal customers (employees). With reference to this, Papasolomou and Vrontis (2006) consider that investing in employee motivation is undoubtedly an essential requirement in the search for competitive advantages in businesses. As such, the essence of co-operatives, as social economy businesses, is related to the internal marketing dimensions given that it is based on balance among material, financial, and human resources (Fernández et al., 2018). Similarly, Ahmed and Rafiq (2003) indicated that internal marketing helps the development and maintenance of the inter-functional relationships among employees who, as internal customers, are involved in the co-creation of value, which is used to attain success within the organizations.

In this context, the International Cooperative Alliance has significantly contributed to the bilateral processes of knowledge transfer through inter-organizational relationships on a local, national, and international level, leading to the institutional strengthening of these co-operatives. For their part, the Swiss Co-operation Agency has driven the initiatives for strategy inclusion in the Ecuadorian business world, with internal marketing being one of them. However, these external contributions have not reached the management of all the co-operatives of this Latin American country. This leads us to the need to study the dimensions of internal marketing, in relation to the policies applied in this sector for the motivation and involvement of their employees. In any case, every country and global sector has a series of socio-economic and cultural activities and characteristics that make them different (Huang and Rundle-Thiele, 2014).

Accordingly, the co-operative sector faces diverse problems, such as inequality regarding incentives, excessive controls, bureaucracy, and strong competition, even with commercial companies. Therefore, the challenge that goes with this problem is focused on creating strategies that allow for taking advantage of strengths derived from its co-operative principles for the co-creation of value. This should guarantee continuity and expansion in the market (Ferraz et al., 2018). Hence, this study aims to provide a measurement tool that fits the specific needs and characteristics of the cooperative sector, considering the complexity of the study of this sector, which encompasses multiple activities. Mainly financial (savings and credit cooperatives) and non-financial (housing cooperatives, services, production, and consumption) stand out in Ecuador. This instrument could enable these organizations to know the perception of their employees, regarding the strategies that are implemented for the management of human capital and undertake improvement actions that allow the co-creation of value and organizational sustainability.

Therefore, the study of internal marketing in Ecuadorian cooperatives has been considered appropriate, since they represent a significant part of the social economy, especially in developing countries. Thus, the main objective of this research is to analyze and validate, if seen fit, the dimensions of internal marketing through the application of a measuring instrument adapted to the cooperative sector. With this starting point, this study uses the Jaworski and Kohli (1993) and Lings (1999) model,

with this being the one which best supports the compliance of the aim of the investigation, due to having a synergy connection between the internal market (business) and the internal customer (employee). The suggested scale corresponds to the adaptation of the internal marketing dimensions considered by various authors (among others, Ruizalba et al., 2014, 2015; Kim et al., 2016; Cerqueira et al., 2018).

This article is structured into five main sections and begins with the literature review, which consists of the scientific basis before this study. Secondly, there is the methodology of the research based on the field work and the measuring scale. In the following, the results will be presented through a model of structural equations and their discussion. Finally, the conclusions are suggested, as well as the limitations of the study and future lines of research.

LITERATURE REVIEW

Internal Marketing

Strategic management is a significant element that leads to the success of an organization, a process which should be focused on employees, who, with their intellectual capacity, skills, abilities, and motivations, provide jobs that are prone to achieving institutional goals (Abzari et al., 2011). The approaches presented by the conceptualizations of internal marketing also determine its influence on the external client, since an adequate working climate, where the wishes and needs of employees are considered, implies a better performance in their work activities. This, in turn, significantly influences external customer satisfaction (Lizote et al., 2019).

Internal marketing has its origin in the work of Berry et al. (1976), although this construct continues to be in constant evolution, allowing for advances in its conceptualization. In this way, Lings (1999) proposes that, in addition to the employee knowing the business' information, the officers should be interested in the employees' needs and wishes. From this point of view, Ahmed and Rafiq (2002) define internal marketing as the planned effort of motivating employees through marketing techniques, to implant and integrate business strategies aimed at the customer. In addition, Anosike and Ahmed (2009) indicate that the exchange of ideas between an employer and an employee contributes to achieving common benefits. For their part, Cerqueira et al. (2018) propose treating employees as internal customers and their activities as internal products, which satisfy the needs and wishes of external customers.

As such, the adoption of internal marketing allows for the business to align its strategies with the needs of the internal customer in order to introduce benefits to the organization (Gounaris et al., 2010). In this way, institutions that apply this management philosophy ensure the efficiency of the service provided by the employees, which would help improve the satisfaction of the external customer (Barzoki and Ghujali, 2013; Jaeger et al., 2016; Lizote et al., 2019). In this respect, Oliveira and Pataco (2017) confirm that motivated and loyal employees have more positive attitudes toward their businesses and their management, which leads to an increase in income. In this context, the internal marketing approach is basically

aimed at all the interactive activities within the institutions, with the purpose of providing a quality work environment (Zebal, 2018). Because of this, the understanding of the dimensions of this construct allows for identifying the dimension that most contributes to the co-creation of value, given that internal marketing influences attitudes and behavior of the internal customer to transmit it, by doing so, to the external customer (Dean et al., 2016; Chiu et al., 2019).

The boom that has occurred in internal marketing in recent times comes from research that suggests diverse activities tending to know, analyze, and respond to the needs of employees, which has given way to the dimensions of this construct (Ruizalba et al., 2015). In this case, the theoretical references regarding internal marketing models and their dimensions were proposed by the precursors in this construct (Parasuraman et al., 1985; Grönroos, 1990; Jaworski and Kohli, 1993; Lings, 1999; Rafiq and Ahmed, 2000; Bansal et al., 2001).

Based on this, the importance of the dimensions which cover internal marketing in the co-operatives of Ecuador is highlighted, considering that it generates co-creation of value to the service, which provides the institutions that have applied it; thus, it improves their results (Yu et al., 2018). This has determined a growing interest from the officers and those responsible in the dimensions of internal marketing, as a primordial factor within the good practices of internal management. Albassami et al. (2015) shows that it is not only a statement of intent, but that it also respects the rights of the workers, bearing in mind equality, no discrimination, a dignified job, conciliation between family and professional life, etc. As such, it is necessary to consider the aspects indicated beforehand to measure internal marketing, with the idea of developing a measuring instrument of this construct that can be considered an effective tool for the management when making strategic decisions (Park and Tran, 2018).

Dimensions of Internal Marketing

The analysis of the internal marketing dimensions sifts a fundamental part of the overall management of a business given that, through its study and application, the employee's satisfaction and the subsequent achievement of the same goals can be reached (Abzari et al., 2011). This is the reason why diverse studies (among others, Lings and Greenley, 2010; Ali, 2016; Braimah, 2016) have led to defining two important variables within internal marketing, with the first being the identification of the business as an internal market and, the second, the determination of the employees as internal customers. In this way, the dimensions of this construct are projected to highlight these characteristics (Foreman and Money, 1995; Lux et al., 1996). However, Parasuraman et al. (1985) and Grönroos (1990) propose a unidimensional model of internal marketing, considering only the macro-dimension of customer orientation. Despite this model having been used in current research (among others, Yildiz and Ali, 2017; Piha and Avlonitis, 2018), it has been the subject of criticism and restructuring due to the limitations that it provides in the real application of the internal marketing strategies in businesses of different sizes and in different activity sectors.

All of this has led to the development of models, which determine a multi-dimensional perspective of internal marketing. In this sense, Jaworski and Kohli (1993) and Lings (1999) distinguish three dimensions of this construct: (1) generation of internal intelligence, (2) Internal Communication (IC), and (3) response to internal intelligence, which, at the same time, is divided into six sub-dimensions. For their part, Rafiq and Ahmed (2000) complete a redesign of the one-dimensional model of Parasuraman et al. (1985) and Grönroos (1990), adding three new dimensions: (1) empowerment, (2) inter-functional co-ordination, and (3) communication, establishing a model of four dimensions. Afterward, Bansal et al. (2001) suggest a model of six internal marketing dimensions: (1) employment security, (2) extensive training, (3) generous rewards, (4) sharing information, (5) employee empowerment, and (6) reduced status distinction.

The application of the Jaworski and Kohli (1993) and Lings (1999) model in various studies has made it possible to determine the validity and consistency of its dimensions, albeit with a focus on mercantilist companies and in a geographical and cultural field different from that under study in this research (Ruizalba et al., 2015; Kim et al., 2016; Cerqueira et al., 2018).

More recent studies (among others, Ruizalba et al., 2014; Braimah, 2016; Cerqueira et al., 2018; Park and Tran, 2018; Mero et al., 2020) have redesigned the three dimension model of Jaworski and Kohli (1993) and Lings (1999), considering the initial sub-dimensions of the same as true first-class dimensions, which has led them to the suggestion of a much more complete and versatile model of six dimensions: Identify Value Exchange (IVE), Internal Market Segmentation (IMS), IC, Management Concern (MC), Training (TR), and work/family. For this reason, this research will use this vision of six internal marketing dimensions as a reference; given its great adaptability to different socio-economic environments which, in this empirical study, applies to Ecuador's co-operativism, considered a developing country.

Using this model, it should be indicated that the IVE dimensions' job is to collect information about the internal market, so that what the employees hope to receive from the business is known, as well as the benefits that they are going to give to the business. This component occurs when hiring staff, when the values of new staff are identified, as well as those of the organization, so as to know if they share the same philosophy (Lings, 2004). On the other hand, the IMS dimension, involves the separation of functions which each employee of the organization performs, considering aspects of macro-segmentation (socio-demographic aspects) and micro-segmentation (attitude, behavior, etc.), all of this at diverse levels of management (Gounaris, 2006).

For its part, the IC dimension is essential in all the interpersonal relationships that help the development of activities through the exchange of information between the leader and the employees (Chiu et al., 2019). In this sense, Ahmed and Rafiq (2002) show that communication should be extended to different levels of the organization, to be able to influence the behavior of all the employees. As such, the improvement of IC could offer unique capacities for a significant performance

in the target market (Danso et al., 2017). MC, as an internal marketing dimension, suggests that supervisors should worry about knowing the present and future expectations that workers have (Ruizalba et al., 2014); disclosing good management practices to motivate employees in the performance of their work (Chareonwongsak, 2017). In relation to TR, this dimension looks to prepare employees in the development of abilities and capacities that the work position requires and, in turn, means an opportunity for its growth within the business (Abbas and Riaz, 2018).

Finally, in terms of the Work/Family Balance (WFB) dimension, Narteh (2012) considers the family as an interest group (stakeholder) of the business itself. And, in this case, businesses that want to keep their best employees have to favor the development of policies that allow for the harmonization of family and work life, as both are mutually sustained (Tang et al., 2020). These employees will feel understood by the business, when it develops strategies to reconcile their work and family life (Ruizalba et al., 2014; Solat et al., 2020).

In conclusion, the multi-dimensional vision of internal marketing has been analyzed in different empirical studies, mainly focused on the United States, Europe, and Asia, with excellent results that have allowed for the consolidation of internal marketing in these geographical areas (Clampitt and Downs, 1993; Back et al., 2011; Hoque et al., 2018), but there is an important deficit of empirical research regarding this construct in Latin America.

METHODOLOGY

Survey Design

The aim of this study is to analyze the dimensions of internal marketing, through the validation of a measuring instrument applicable to co-operativism in Ecuador. To achieve this, a preliminary list of measuring items was suggested; this was generated after a review of the literature related to the internal marketing dimensions. In the adaptation phase of the questionnaire, a review with Ecuadorian specialists involved with the popular and solidary economy sector (referred to in this way in the Latin American country) was carried out and used to discard errors in terms and understanding. Afterward, a pre-test was given to 40 participants, to detect possible deviations and errors directly in the field being studied.

The questionnaires have been prepared from two points of view, the administrators that represent the organization and the employees as internal customers. The structure of the questionnaire consists of open and closed questions, regarding aspects such as work and socio-demographic details. For their part, these items of internal marketing dimensions are measured using a Likert scale of five points, giving the surveyees the options that range between (1 = completely disagree and 5 = completely agree).

Data Collection

The procedure of the field work consisted of a survey *in situ* with staff that works in the co-operatives. This questionnaire was applied to a team of surveyors from the Eloy Alfaro de Manabí Lay University (Ecuador). Initially, the purpose of the

study was explained to the administrators of every co-operating party, requesting the respective permission of the employees. The questionnaires were designed in Spanish and they were complemented under the presence of surveyors, with the aim of responding to any question that may arise. The field work was done between the months of January and April 2018. The rejection rate was very low and it was not related to any specific variable. The length of the survey never lasted more than 15 min, in any case.

Sample and Sampling Error

The population of this study includes administrators and employees of financial and non-financial co-operatives in Ecuador. As such, a stratified sampling was carried out which obtained 2,499 surveys. The co-operatives in Ecuador are classified in financials, who are additionally subdivided into segments from 1 to 5 (in terms of the figure of assets) and into non-financials, which are grouped by their branch of activity, with these being services, housing, production, and consumption (Superintendencia de Economía Popular y Solidaria (SEPS), 2017). The sample is distributed among 1,414 women and 1,085 men. The ages range from 18 to 60. A sample error of $\pm 1.89\%$ was considered for a confidence level of 95%.

Data Analysis

Once the field work was finished, the verification of the data was undertaken, removing all those questionnaires that present absent values in any item. The SPSS v.23 software was used, where the descriptions for each one of the elements was calculated, studying its asymmetry, together with normality, on a univariant level as well as on a multi-variant one. Secondly, an exploratory factorial analysis and another confirmatory one were carried out, with a structural equations model to study the validity of the scale, using Amos Graphics v23 software. For the development of the research, a quantitative approach was applied, which was based on a deductive plan to look for mechanisms to confirm the viability of the instruments used.

RESULTS

Design of the Measuring Scale

The theoretical analysis regarding internal marketing has allowed for the definition of this construct with its respective questions that were applied in the adaptation of the questionnaire, in a way which contributes with the information needed to achieve the aim of the study. The structure of the questionnaire consists of aspects related to socio-demographic data, such as age, sex, education, marital status, and children; as well as those related to work position and contract type, working day, length of service, role, and pay, among others. This information allows us to identify the organizational structure of Ecuadorian co-operatives. On the other hand, the dimensions of internal marketing are based on the current re-design of the Jaworski and Kohli (1993) and Lings (1999) models, based on six dimensions: IVE (four items), IMS (three items), IC (four items), MC (five items), TR (three items), and WFB (three items).

Validity of the Measuring Scale

In the exploratory factor analysis, the method of main components with varimax rotation (maximum variance) was applied, which determined that all the common factors are greater than one, thus considering that they are adequate with the variables. The viability of the factorial analysis was evaluated with the following criteria: the original correlations presented a large number of correlations (88.90% with a value greater than 0.30), Bartlett's test for sphericity showed that the variables were not independent [$\chi^2(231) = 11,114.48, p < 0.001$]. The Kaiser-Meyer-Olkin (KMO) measure of appropriate sampling obtained a value of 0.893, being considered to be adequate. All the values of the Measures of Sampling Adequacy (MSA) were found to be above 0.88.

In the varimax rotation (Table 1), the criteria used for assigning an item to the factor was that which presented a factorial load greater than 0.30, which explains 72.31% of the total variance, determining six factors in this way. The first factor explains 15.63% of the total variance and has high and positive correlations with items 1–4; therefore, we call this first factor or dimension IVE. The second factor explains 12.37% of the total variance and has a positive correlation with items 5–7; identifying this factor as IMS. The third factor represents 11.61% of the total variance, with a positive correlation with items 8–11; which we refer to as IC. The fourth factor which explains 11.38% of the total variance has a positive correlation with items 12–16; which is known as MC. The fifth factor explains 11.32% of the total variance, having a positive correlation

with items 17–19; and which we call TR. Finally, the sixth factor represents 10% of the total variance and has a positive correlation with items 20–22; this factor or dimension is known as WFB.

Confirmatory Factor Analysis

The previous results of the exploratory analysis confirm the appropriateness of the measuring scale. Additionally, a confirmatory analysis with a model of structural equations and the application of the extraction method of maximum plausibility was carried out. All of this allows for the discovery of the convergent validity of the instrument proposed in the exploratory factor analysis, whose structure consists of six dimensions and 22 indicators in total. The results obtained were statistically significant ($p < 0.05$) and the factorial loads presented values greater than 0.5 by which we can indicate that all of the indicators satisfactorily saturate each latent variable. Definitively, it can be confirmed that the proposed model regarding the factorial structure of the scale is consistent (Figure 1).

For the analysis of the model's Goodness of Fit Indexes (GFIs), comparative fit statistics were used, such as: Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Normed Fit Index (NFI). In this way as well, the unhurried fits GFI, Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA). A confidence interval of 90% was considered. The results of the CFI, TLI, and NFI fit indexes show values greater than 0.96. For their part, the GFI and

TABLE 1 | Exploratory factor analysis internal marketing questionnaire.

	Dimension					
	IVE	IMS	IC	MC	TR	WFB
IM1 Your employees needs.	0.620					
IM2 Meetings between manager and employee	0.814					
IM3 Inquiry of expectations	0.809					
IM4 Prove labor satisfaction	0.658					
IM5 Well defined groups		0.774				
IM6 Design of socialized politics		0.610				
IM7 Equal opportunities		0.551				
IM8 Interest in management			0.521			
IM9 Communication of unemployment			0.472			
IM10 Permanent attention to employee			0.724			
IM11 Direct information from management			0.561			
IM12 Inversion of resources on employees				0.701		
IM13 Ones necessities creates politics				0.725		
IM14 Management mediator of conflict				0.740		
IM15 Personalized attention toward employee				0.590		
IM16 Management compression				0.559		
IM17 Communication about new changes					0.779	
IM18 Permanent training					0.724	
IM19 Training for new positions					0.801	
IM20 Compassion toward family necessities						0.789
IM21 Support of work/family relationship						0.853
IM22 Encourages an equilibrium between work and family						0.684
Eigen values	8.16	2.61	1.87	1.35	1.19	1.09
% Variance explained	15.63	12.37	11.61	11.38	11.32	10.00
% Variance explained cumulative	15.63	28.00	39.61	50.99	62.31	72.31

Source: Own elaboration.

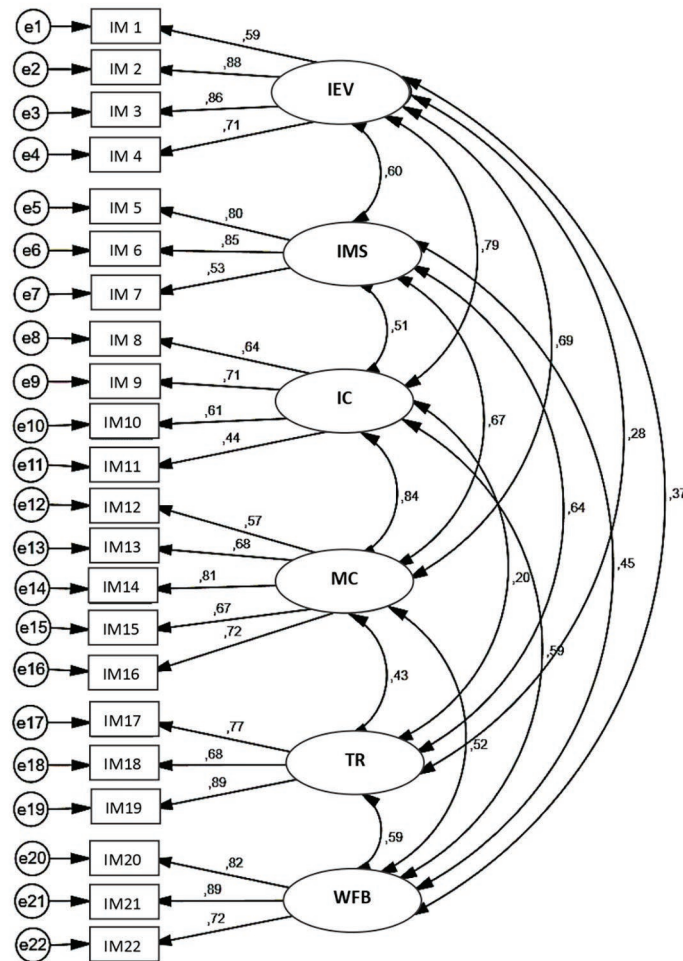


FIGURE 1 | Estimation of structural model internal marketing.

TABLE 2 | Goodness of fit statistics confirmatory factor analysis (CFA).

	$\chi^2(\text{gl})$	p	χ^2/gl	GFI	AGFI	CFI	NFI	TLI	RMSEA (I.C. 90%)
Total	2679.14 (194)	<0.001	13.80	0.97	0.97	0.97	0.96	0.97	0.048 (0.038–0.063)
Subsample 1	2121.47 (194)	<0.001	10.90	0.96	0.96	0.96	0.95	0.95	0.053 (0.044–0.074)
Subsample 2	2073.53 (194)	<0.001	10.70	0.94	0.96	0.95	0.94	0.95	0.052 (0.044–0.073)

Source: Own elaboration.

AGFI indexes presented values greater than 0.97 and the value obtained from the RMSEA is 0.048 (Table 2). These results indicate that the fit of the initial theoretical scale model is high.

With respect to the reliability of the scale, Cronbach's alpha coefficient was used which determines the internal consistency of the items of each of the dimensions. Bryman (2004) and Sekaran and Bougie (2010) coincide that Cronbach's alpha coefficient, with an average of 0.5–0.7, is a moderate and acceptable level for research in social sciences. Thus, the greater the coefficient, the better the reliability of the scale will be (IVE = 0.921, IMS = 0.899, IC = 0.914, MC = 0.865, TR = 0.876, WFB = 0.899), which indicates a very high reliability.

DISCUSSION

Internal marketing originated from the need to improve the quality of services offered to external clients and through motivation, satisfaction, and the commitment of the employees, knowing that an employee who is satisfied and integrated in the business project increases the organization's productivity and income (Mishra, 2018). This determines a strong relationship between employees and the orientation to the internal market with the development of competitive advantages for organizations. Employees are considered as unique assets, difficult to copy or imitate by competition and so, the orientation to the internal

market involves indirectly influencing the perception of the external customer (Mainardes et al., 2019).

In this context, the literature review leads us to the analysis of the possible multidimensionality of internal marketing. Recent studies show such characterization in the empirical application of different theoretical models (Tang et al., 2020). With this background, the need to propose the adaptation of a scale that allows to measuring the relationship of each of the dimensions immersed in this construct and its adjustment to the particularities of the cooperative sector in developing countries is appropriate. Matters that seek to strengthen strategic management and provide tools that help to co-create value with what has been considered its brand of identification, that is to say, the co-operative principles and values in order to improve the labor climate in the organization (Dean et al., 2016; Dong et al., 2016; Kesen et al., 2017).

The study carried out allows for ensuring the validity and reliability of a scale to measure the dimensions of internal marketing in the co-operativism of Ecuador. In this way, the adaptation of the questionnaire used instruments that had already been applied to different empirical studies in different geographic environments. Among them is Ruizalba et al. (2014), which adopted and validated a questionnaire with six dimensions, through an empirical study applied to the hotel sector in Spain with a sample of 750 hotels. Similarly, Ali (2016) focused his work on five dimensions comprising 26 items, applied to 305 employees of the Arab Academy of Science, Technology and Maritime Transport of Egypt, obtaining significant results in all its dimensions. Sarker and Ashrafi (2018) applied a tool that analyzed seven dimensions of internal marketing, with a target population of 250 retail store employees in the city of Dhaka, Bangladesh, where the significant effect on employee satisfaction was evident. In turn, Ramos (2018) in his research on this construct, considered the employees of 39 financial institutions in the Philippines, who used a five-dimensional composite instrument, obtaining results appropriate to the objectives set.

More recently, Chiu et al. (2019) proposed a five-dimensional internal marketing measurement instrument, which was applied to workers from various sports centers in the city of Tapei, the results of which revealed adequate adjustments to the model. Tang et al. (2020) conducted a study based on an eight-dimensional scale, which reflects the perceptions of flight attendants of the most recognized airlines in the United States, in order to determine the effect of internal marketing on workers' happiness, resulting in all dimensions having significant and positive relationships, with the exception of the compensation dimension.

This research context reflects the gap in the study of internal marketing in the sector of the social economy to which cooperatives belong, which are basically governed by universal principles focused on the human being. Reciprocity and balance are expected from these institutions in the actions employees-organization, in compliance with the principle of mutual assistance (Mero et al., 2020). It is for this reason that this quantitative study applied to employees and managers of Ecuadorian cooperatives has been raised, proving that it is appropriate and supports the internal marketing dimensions of the redesigned model of Jaworski and Kohli (1993) and

Lings (1999), in its most recent and adapted version of six dimensions: IVE, IMS, IC, MC, TR, and WFB. It is important to indicate that the dimensions of this construct show bi-directionality (business-employee) in its structure, resulting in its easy adaptation for any type of institution of social economy, considering the few studies in this area of activity.

CONCLUSION

Internal marketing is one of the primordial factors in the management of human talent and, for its development, strategies should be established which bear in mind the dimensions of this construct, with the purpose of satisfying the internal customer. Therefore, it shall provide a quality service that adapts to the characteristics and needs of the external customer, increasing the practices of co-creation of value through it. The results of this study provide a multi-dimensional instrument for measuring internal marketing, which seeks to strengthen the strategic management of the human resources of Ecuadorian cooperatives. Therefore, the study on the dimensions of this construct has its main application in the presentation of a scale that allows to measuring internal marketing, in such a way that they help these organizations to improve their relationship with employees. It should be considered that recent studies focused on this construct have been applied in purely mercantilist companies in United States, Europe, and Asia with satisfactory results. However, each area of application has different culture, values, norms, and ways of thinking and behaving; which justifies the necessary adaptation and validation of a questionnaire in accordance with the reality of Ecuadorian co-operativism in order to achieve the aims of the research.

The novelty of the study for the cooperative sector is highlighted, since they have different areas of activity and different market orientation than mercantilist companies. These institutions of the social economy have been identified by their co-operative values and principles, where the spirit of participation and collaboration for the search of socio-economic wellbeing and the satisfaction of their stakeholder are very important. With this idea, the measuring instrument for internal marketing for the co-operatives of this developing Latin American country has been obtained as a result of the empirical study carried out and its validation, demonstrating that internal marketing can be measured through six dimensions and 22 items, correlated among them, unlike the other studies where five dimensions have been proposed for the most part.

Definitively, the measuring scale provided in this research becomes an instrument that can be used in other sectors, financial ones as well as non-financial ones, given that the Ecuadorian co-operatives develop their activity in different sectorial environments, such as services, housing, production, and consumption, among others, and in very different volumes of business. As such, this research offers a tool for analyzing internal marketing, appropriately adaptable to different organizational realities.

Its application will allow leaders and managers to know the needs and expectations that employees have and, this way,

improve the efficient management of human capital in their company. In addition, this implementation would also assist the specific control body of the Ecuadorian government, the Superintendency of Popular and Solidarity Economy, responsible for its promotion and control.

The study presented limitations in relation to the previous data regarding the number of employees in the co-operatives, due to there not being an official reference on behalf of the Popular and Solidary Economy Superintendent of the Government of Ecuador. As such, it was necessary to work with an approximate standard provided by the Ministry of Labor in this country. Finally, for future lines of investigation, we propose the application of this measuring instrument to other business groups with the purpose of ratifying the signaled adaptability and, in addition, analyzing whether there is a relationship among internal marketing and other variables of human capital management, such as, for example, the organizational commitment. Finally, a more in-depth study of the causal relationship between the dimensions of internal marketing and the co-creation of value in these institutions of social economy would be interesting.

REFERENCES

- Abbas, R. A., and Riaz, M. T. (2018). The effect of internal marketing dimensions on organizational commitment of employees: an investigation among private banks in Faisalabad, Pakistan (a study based on different dimensions of internal marketing). *Eur. Online J. Nat. Soc. Sci.* 7, 147–165.
- Abzari, M., Ghorbani, H., and Madani, F. A. (2011). The effect of internal marketing on organizational commitment from market-orientation viewpoint in hotel industry in Iran. *Int. J. Mark. Stud.* 3, 147–155. doi: 10.5539/ijms.v3n1p147
- Ahmed, P. K., and Rafiq, M. (2002). *Internal marketing: Tools and concepts for customer focused management*. Oxford: Butterworth-Heinemann.
- Ahmed, P., and Rafiq, M. (2003). Internal marketing issues and challenges. *Eur. J. Mark.* 37, 1177–1186. doi: 10.1108/03090560310498813
- Albassami, F. A., Al-Meshal, S. A., and Bailey, A. A. (2015). An investigation of internal marketing and its effects on employees in the banking sector in Saudi Arabia. *J. Financ. Serv. Mark.* 20, 176–190. doi: 10.1057/fsm.2015.11
- Ali, S. Y. (2016). Determine the effect of relationship between internal marketing variables and employees' job satisfaction and organizational commitment: case study of Arab academy for science, technology and maritime transport. *Bus. Manag. Rev.* 7, 124–133.
- Anosike, U. P., and Ahmed, P. K. (2009). Internal marketing: focus on practice. *Int. J. Manag. Pract.* 3, 369–382. doi: 10.1504/IJMP.2009.026962
- Back, K. B., Lee, C. K., and Abbott, J. A. (2011). Internal relationship marketing: Korean casino employees job satisfaction and organizational commitment. *Cornell Hosp. Q.* 52, 111–124. doi: 10.1177/1938965510370742
- Bailey, A. A., Albassami, F., and Al-Meshal, S. (2016). The roles of employee job satisfaction and organizational commitment in the internal marketing-employee bank identification relationship. *Int. J. Bank Mark.* 34, 821–840. doi: 10.1108/IJBM-06-2015-0097
- Bansal, H., Mendelson, M., and Sharma, B. (2001). The impact of internal marketing activities on external marketing outcomes. *J. Qual. Manag.* 6, 61–76. doi: 10.1016/S1084-8568(01)00029-3
- Barzoki, A. S., and Ghujali, T. (2013). Study the relationship of internal marketing with job satisfaction, organizational commitment and organizational citizenship behavior. *Int. J. Acad. Res. Bus. Soc. Sci.* 3, 33–49.
- Berry, L., Hensel, J. S., and Burke, M. C. (1976). Improving retailer capability for effective consumerism response. *J. Retail.* 52, 3–14.
- Braimah, M. (2016). Internal marketing and employee commitment in the hospitality industry. *Afr. J. Hosp. Tour. Leis.* 5, 1–22.
- Bryman, A. (2004). *Social research methods*. New York, NY: Oxford University Press.
- Cerqueira, A. D. S., Mainardes, E. W., and de Oliveira, J. L. B. (2018). Dimensions of internal market orientation related to job satisfaction and appreciation in Brazilian healthcare service. *J. Health Manag.* 20, 291–308. doi: 10.1177/0972063418779903
- Chareonwongsak, K. (2017). Enhancing board motivation for competitive performance of Thailand's co-operatives. *J. Coop. Organ. Manag.* 5, 1–13. doi: 10.1016/j.jcom.2017.01.001
- Chiu, W., Won, D., and Bae, J. -S. (2019). Internal marketing, organizational commitment, and job performance in sport and leisure services. *Sport Bus. Manag. Int. J.* 10, 105–123. doi: 10.1108/SBM-09-2018-0066
- Clampitt, P. G., and Downs, C. W. (1993). Employee perceptions of the relationship between communication and productivity: a field study. *J. Bus. Commun.* 30, 5–28. doi: 10.1177/002194369303000101
- Danso, A., Poku, K., and Agyapong, A. (2017). Mediating role of internal communications in market orientation and performance of mobile telecom firms: evidence from Ghana. *Cogent Bus. Manag.* 4, 1–15. doi: 10.1080/23311975.2017.1403713
- Dean, D., Arroyo-Gamez, R. E., Punjaisri, K., and Pich, C. (2016). Internal brand co-creation: the experiential brand meaning cycle in higher education. *J. Bus. Res.* 69, 3041–3048. doi: 10.1016/j.jbusres.2016.01.019
- Dong, X. D., Zhang, Z., Hinsch, C. A., and Zou, S. (2016). Reconceptualizing the elements of market orientation: a process-based view. *Ind. Mark. Manag.* 56, 130–142. doi: 10.1016/j.indmarman.2015.12.005
- Fernández, A., Hernández, A., Hernández, M., and Chicaiza, O. (2018). Savins and credit cooperatives in Pichincha, Ecuador: is this a sustainable social management case? *J. Secur. Sustain. Issues* 7, 549–558. doi: 10.9770/jssi.2018.7.3(14)
- Ferraz, L. Z. T., Rezende, A. J., Resende de Lima, J. P., and Todeva, E. (2018). Perception of value co-creation actions in agricultural cooperatives. *BAR Braz. Adm. Rev.* 15, 1–32. doi: 10.1590/1807-7692bar2018180005
- Foreman, S. K., and Money, A. H. (1995). Internal marketing: concepts, measurement and application. *J. Mark. Manag.* 11, 755–768. doi: 10.1080/0267257X.1995.9964388
- González, F., Sánchez, S. M., and López Guzmán, T. (2016). The effect of educational level on job satisfaction and organizational commitment: a case study in hospitality. *Int. J. Hosp. Tour. Adm.* 17, 243–259. doi: 10.1080/15256480.2016.1183547
- Gounaris, S. P. (2006). Internal-market orientation and its measurement. *J. Bus. Res.* 59, 432–448. doi: 10.1016/j.jbusres.2005.10.003
- Gounaris, S., Vassilikopoulou, A., and Chatzipanagiotou, K. (2010). Internal-market orientation: a misconceived aspect of marketing theory. *Eur. J. Mark.* 44, 1667–1699. doi: 10.1108/03090561011079837

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

FG, NM, ML, and AH conceptualized the work and reviewed the literature, interpreted and curated the data, and wrote the manuscript. The authors read and revised the manuscript several times. All authors contributed to the article and approved the submitted version.

- Grönroos, C. (1990). Relationship approach to marketing in service contexts: the marketing and organizational behavior interface. *J. Bus. Res.* 20, 3–11. doi: 10.1016/0148-2963(90)90037-E
- Hoque, A. S., Siddiqui, B. A., Awang, Z. B., and Baharu, S. M. (2018). Exploratory factor analysis of entrepreneurial orientation in the context of Bangladeshi small and medium enterprises (SMEs). *Eur. J. Manag. Mark. Stud.* 3, 81–94. doi: 10.5281/zenodo.1292331
- Huang, Y. T., and Rundle-Thiele, S. (2014). The moderating effect of cultural congruence on the internal marketing practice and employee satisfaction relationship: an empirical examination of Australian and Taiwanese born tourism employees. *Tour. Manag.* 42, 196–206. doi: 10.1016/j.tourman.2013.12.005
- Jaeger, N. A., Zacharia, N. A., and Brette, M. (2016). Nonlinear and dynamic effects of responsive and proactive market orientation: a longitudinal investigation. *Res. Mark.* 33, 767–779. doi: 10.1016/j.jresmar.2016.01.006
- Jaworski, B. J., and Kohli, A. K. (1993). Market orientation: antecedents and consequences. *J. Mark.* 57, 53–70. doi: 10.2307/1251854
- Kesen, M., Turan, P. M., and Kutay, N. (2017). The effects of internal marketing on organizational trust: a research in hotel industry. *Bus. Manag. Stud. Int. J.* 5, 23–28. doi: 10.15295/bmij.v5i4.162
- Kim, J., Song, H. J., and Lee, C. K. (2016). Effects of corporate social responsibility and internal marketing on organizational commitment and turnover intentions. *Int. J. Hosp. Manag.* 55, 25–32. doi: 10.1016/j.ijhm.2016.02.007
- Lings, I. (1999). Balancing internal and external market orientations. *J. Mark. Manag.* 15, 239–263. doi: 10.1362/026725799784870342
- Lings, I. N. (2004). Internal market orientation: construct and consequences. *J. Bus. Res.* 57, 405–413. doi: 10.1016/S0148-2963(02)00274-6
- Lings, I. N., and Greenley, G. E. (2010). Internal market orientation and market-oriented behaviours. *J. Serv. Manag.* 21, 321–343. doi: 10.1108/09564231011050788
- Lizote, S. A., Ribeiro Alves, C. S., and Cavalheiro, C. C. (2019). Perceived organizational factor, internal marketing and organizational commitment in university teachers. *Revista Pensamento Contemporâneo em Administração* 13, 88–107. doi: 10.12712/rpca.v13i2.28209
- Lux, D. J., Jex, S. M., and Hansen, C. P. (1996). Factors influencing employee perceptions of customer service climate. *J. Mark. -Focus. Manag.* 1, 65–86. doi: 10.1007/BF00129604
- Mainardes, E. W., Rodrigues, L. S., and Teixeira, A. (2019). Effects of internal marketing on job satisfaction in the banking sector. *Int. J. Bank Mark.* 37, 1313–1333. doi: 10.1108/IJBM-07-2018-0190
- Mero, N. M., Fernández, A. H., Alcivar, M. I. L., and Santa Cruz, F. G. (2020). Influence of internal marketing dimensions on organizational commitment: an empirical application in ecuadorian co-operativism. *SAGE Open* 10, 1–10. doi: 10.1177/2158244020945712
- Mishra, T. (2018). Diamond shape model advanced model of service triangle. *Int. J. Trend Sci. Res. Dev.* 2, 2445–2448. doi: 10.31142/ijtsrd12707
- Narteh, B. (2012). Internal marketing and employee commitment: evidence from the Ghanaian banking industry. *J. Financ. Serv. Mark.* 17, 284–300. doi: 10.1057/fsm.2012.22
- Oliveira, M., and Pataco, T. (2017). Internal marketing as an integration tool of trainees. *Turismo & Desenvolvimento* 27, 267–269.
- Papasolomou, I., and Vrontis, D. (2006). Building corporate branding through internal marketing: the case of the UK retail bank industry. *J. Prod. Brand Manag.* 15, 37–47. doi: 10.1108/10610420610650864
- Parasuraman, A., Valarie, A. Z., and Berry, L. L. (1985). A conceptual model of service quality and its implication for future research. *J. Mark.* 49, 41–50. doi: 10.2307/1251430
- Park, J., and Tran, T. B. H. (2018). Internal marketing, employee customer-oriented behaviors, and customer behavioral responses. *Psychol. Mark.* 35, 412–426. doi: 10.1002/mar.21095
- Piha, L., and Avlonitis, G. (2018). Internal brand orientation: conceptualisation, scale development and validation. *J. Mark. Manag.* 34, 370–394. doi: 10.1080/0267257X.2018.1445658
- Puusa, A., and Hokkila, K., Varis, A. (2016). Individuality vs. communality—A new dual role of co-operatives? *J. Coop. Organ. Manag.* 4, 22–30. doi: 10.1016/j.jcom.2016.02.002
- Rafiq, M., and Ahmed, P. (2000). Advances in the internal marketing concept: definition, synthesis and extension. *J. Serv. Mark.* 14, 449–462. doi: 10.1108/08876040010347589
- Ramos, W. J. (2018). Internal marketing dimensions and organizational commitment of universal banks' employees. *Rev. Integr. Bus. Econ. Res.* 7, 39–51.
- Ruiz-Alba, J. (2013). El Compromiso Organizacional: Un valor personal y Empresarial en el Marketing Interno. *Estudios Empresariales* 1, 67–86. doi: 10.3926/ic.455
- Ruizalba, J., Bermúdez-González, G., Rodríguez-Molina, M. A., and Blanca, M. J. (2014). Internal market orientation: an empirical research in hotel sector. *Int. J. Hosp. Manag.* 38, 11–19. doi: 10.1016/j.ijhm.2013.12.002
- Ruizalba, J., Vallespin, M., and Pérez, J. (2015). Gestión del Conocimiento y orientación al Marketing interno en el desarrollo de la ventaja competitiva en el sector hotelero. *Investigaciones Europeas de Dirección y Economía de la Empresa* 21, 84–92. doi: 10.1016/j.iiedee.2014.03.001
- Sarker, R. A., and Ashrafi, D. M. (2018). The relationship between internal marketing and employee job satisfaction: a study from retail shops in Bangladesh. *J. Bus. Retail Manag. Res.* 12, 149–159. doi: 10.24052/JBRMR/V12IS03/ART-13
- Sekaran, U., and Bougie, R. (2010). *Research methods for business: A skill building approach*. Chichester: John Wiley & Sons Ltd, 48–56.
- Solat, S., Abrar, M., Shabbir, R., Bashir, M., Saleem, S., and Saqib, S. (2020). Workplace interactional demands and work-family enrichment: an investigation from the service sector. *Front. Psychol.* 11:1476. doi: 10.3389/fpsyg.2020.01476
- Superintendencia de Economía Popular y Solidaria (SEPS) (2017). *Catastro cooperativas Financieras y no financieras*. Quito: Base de datos.
- Tang, A., Chang, M. -L., Wang, T. -H., and Lai, C. -H. (2020). How to create genuine happiness for flight attendants: effects of internal marketing and work-family interface. *J. Air Transp. Manag.* 87, 1–10. doi: 10.1016/j.jairtraman.2020.101860
- Teixeira, P. N. (2014). Gary Becker's early work on human capital – collaborations and distinctiveness. *IZA J. Labor Econ.* 3, 1–12. doi: 10.1186/s40172-014-0012-2
- Therassa, C., Banu, V., Gayathri, R., Gopalakrishnan, S., and Manikandan, S. (2017). “Linear regression model fit for internal marketing and customer relationship management” in *Proceedings of the International Conference on Intelligent Sustainable Systems (ICISS 2017)*. IEEE Xplore.
- Vieira-dos Santos, J., and Gonçalves, G. (2018). Organizational culture, internal marketing, and perceived organizational support in Portuguese higher education institutions. *J. Work Organ. Psychol.* 34, 38–45. doi: 10.5093/jwop2018a5
- Yildiz, S. M., and Ali, K. (2017). A unidimensional instrument for measuring internal marketing concept in the higher. *Qual. Assur. Educ.* 25, 343–361. doi: 10.1108/QAE-02-2016-0009
- Yu, Q., Asaad, Y., Yen, D. A., and Gupta, S. (2018). IMO and internal branding outcomes: an employees perspective in UK HE. *Stud. High. Educ.* 43, 37–56. doi: 10.1080/03075079.2016.1152467
- Zebal, M. (2018). The impact of internal and external market orientation on the performance of non-conventional Islamic financial institutions. *J. Islamic Mark.* 9, 132–151. doi: 10.1108/JIMA-03-2016-0024

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Mapping Value Co-creation Literature in the Technology and Innovation Management Field: A Bibliographic Coupling Analysis

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Value co-creation has become a very important topic in several disciplines. It is observed that value co-creation has been analyzed mainly from a perspective of marketing or services. The interest of studying value co-creation in relation to innovation is growing but there are no previous literature reviews that focus on the literature that studies value co-creation from a technology and innovation management perspective. The present research aims to close this gap. This research has two aims. First, we make a descriptive analysis of the evolution of documents published from 2004 to 2020. We analyze the main journals and identify the most prolific authors. In addition, we observe collaborative behavior at three different levels – country, institution, and author. Second, we determine the content structure of this literature through a bibliographic coupling analysis, and characterize the resulting groups. As a result of this analysis, we describe eleven thematic groups and characterize them through different metrics. Based on these metrics and the previous analysis, we classify and explain the studies about co-creation in the technology and innovation management field. We obtained three research streams: open innovation, consumer-centric analysis, and service ecosystem and service innovation, and two new trends: servitization and the sharing economy.

Keywords: value co-creation, technology and innovation management, mapping, bibliographic coupling analysis, open innovation, servitization, sharing economy

INTRODUCTION

The term co-creation was popularized in the business context by Prahalad and Ramaswamy (2000, 2004) in an attempt to gauge the dynamics of the relationship between companies and consumers (Ramaswamy and Gouillart, 2010). Research about value co-creation is in an evolutionary phase and has received major attention from academics (Bharti et al., 2015). However, several studies have emphasized the need to deepen the theoretical fundamentals of this subject (Gebauer et al., 2010; Paulin and Ferguson, 2010; Loss and Crave, 2011). According to Saha et al. (2020), it is important to systematically investigate the concept of value co-creation to gain some useful insights that would be helpful for both industry and academia. Our paper is a step in that direction.

The growth of the literature on value co-creation has stimulated the publication of reviews, using different approaches. The first approximations were generic. Galvagno and Dalli (2014) performed

a co-citation analysis and they identify three main theoretical perspectives to study co-creation: services sciences, marketing and consumer research, and innovation and technology management. Bharti et al. (2015) use thematic content analysis to identify 27 elements of co-creation and classify them into five categories: process environment, resource, co-production, perceived benefits, and management structure. Leclercq et al. (2016) conduct an integrative review about value co-creation from the innovation, business, and marketing disciplines. In the following years, some other studies have complemented these first attempts, using bibliometric techniques and adopting general approaches (Alves et al., 2016; Ribeiro et al., 2016; Saha et al., 2020).

Other works have analyzed value co-creation in specific domains such as tourism (Campos et al., 2015; Tregua et al., 2020), public services (Voorberg et al., 2015; Nicola et al., 2019) or health care (Greenhalgh et al., 2016; Aghdam et al., 2020), or regarding particular issues as the value co-creation process in web-based multisided platforms (de Oliveira and Cortimiglia, 2017) or value co-creation in online communities (Priharsari et al., 2020).

Another group of literature reviews has focused on the field of technology and innovation management. Although value co-creation has been analyzed mainly from a perspective of marketing or services, technology and innovation management has been one of the main pillars for this literature (Galvagno and Dalli, 2014). In fact, several articles have reviewed specific aspects of this literature. For example, Ramírez-Montoya and García-Peñalvo (2018) make a systematic literature review about open innovation and the co-creation of knowledge to promote open science. Tekic and Willoughby (2019) conduct a systematic review of the innovation management literature for clarifying the concepts of co-creation and open innovation using bibliometric analysis.

The interest in studying value co-creation in the context of technology and innovation literature is growing. There are several roles that a customer can play in the innovation process: as an information source, co-developer, and innovator (Cui and Wu, 2017). All of these roles have been analyzed in recent years, because of their potential to affect firms' competitive advantage. Also, the phenomenon of value co-creation has extended to other stakeholders, to study their contribution to the innovation process (Akersson et al., 2016). Value co-creation related to technology and innovation management has expanded in several industries, with special intensity in services (tourism, health, and public services) but not exclusively. This heterogeneity has originated a very complex research field that requires effort to produce order and systematization. However, to the best of our knowledge, there are no previous literature reviews that focus on value co-creation from a technology and innovation management perspective. The present research aims to fill this gap by carrying out a bibliometric study to analyze the previous literature on co-creation from the perspective of technology and innovation management and, in this way, to systematize this literature. This study attempts to answer the following research questions: (1) What are the main journals and who are the most prolific authors in the field of value co-creation from a technology and innovation

management perspective? What is the collaborative behavior like between countries, institutions, and authors? (2) What is the knowledge structure of the literature about value co-creation from a technology and innovation management perspective? (3) What are the emerging themes in the field of value co-creation from a technology and innovation management perspective?

To answer these questions, first, we introduce the methodological aspects, going deeper in the different phases we have followed, from delimiting our sample to analyzing the knowledge structure. After that, we make a descriptive analysis of the evolution of documents published from 2004 to 2020. We establish 2004 as the initial point because even though the seminal work is previous (Prahalad and Ramaswamy, 2000), the contributions to the field start to be published in a consistent way after 2004. With the first group of questions, we will shed light on the main characteristics of this literature, determining the most prolific authors, universities, and countries working in this topic, the pattern of collaboration among them (social structure), and the publications editing this research. The aforementioned heterogeneity drives the appearance of researchers and publications that have published works in this topic only in a tangential way. Also, we observe the collaborative behavior at three different levels – country, institution, and author.

Questions 2 and 3 deal with the knowledge structure of the field. The huge variety of subtopics and industries justifies the necessity of systematization, which can also contribute to finding underexplored research lines. In this case, we have used the bibliographic coupling technique that is based on the analysis of shared cited references among papers: if two references are sharing the same sources, they are analyzing similar topics. Based on this argument, we can group the literature in the field and analyze what are these sub-topics and how they are related. We complete this analysis with a more quantitative study of the different groups to determine their evolution and the role they play in the research field. Finally, we present some insights with respect to the future development of this line of research.

METHODOLOGY

To accomplish our research objectives, we have followed the scheme proposed by Kovács et al. (2015), with some adaptations. We have completed four steps: (1) building the database of citing references; (2) preparing the database for analysis; (3) mapping the documents using the bibliographic coupling procedure; and (4) analyzing the networks, adding some relevant information to assess the impact of different topics, and their likely future behavior.

To build the database, we gathered the citing references from the Web of Science (WoS) Core Collection. To guarantee the quality of these documents, we only looked up papers indexed in the Social Science Citation Index (SSCI). Other studies in similar areas have taken the same decision (Teixeira and Mota, 2012; Meyer et al., 2014; Skute et al., 2019). Zupic and Čater (2015) showed this is the most common option in social sciences-related research.

Following previous reviews, we searched the title, abstract, and keywords fields (author and keyword plus) with the following query: (co-creat*OR cocreat* OR “co creat*”) AND (innovat* OR technol*). We limited the results by year (documents published after 2004 included) and type of document (all categories excluded except articles and reviews). Using this search strategy, the query returned 1,708 documents (on May 20th, 2020).

Once we built our database, we used Bibexcel software (Persson et al., 2009) to prepare the data. One of the most highlighted problems of bibliographic coupling is the codification of cited references. All the databases (and WoS is not an exception) have inconsistencies in this field. It is easy to find the same reference written in several different ways. To avoid this, we manually checked all the references to look for inconsistencies. Also, to run all the descriptive statistics we checked author names and affiliations.

We choose bibliographic coupling (Kessler, 1963; Boyack and Klavans, 2010; Mura et al., 2018; Skute et al., 2019) to answer questions 2 and 3, related to the knowledge structure of the field and its emerging topics. Zupic and Čater (2015) point out that bibliographic coupling is an adequate approach to analyze recently published documents. That suitability is due to the focus of this technique on citing documents, using cited references to establish links among them. Some authors have defended the results of this methodology as more precise than results from co-citation analysis or citation analysis (Boyack and Klavans, 2010). In dynamic research fields, the performance of bibliographic coupling is even better, in comparison with other techniques (Vogel and Güttel, 2013).

Our level of analysis was the document. The underlying principle in this technique is that two documents citing the same references are studying similar topics or share a common perspective. In other words, they share the intellectual base (cited references).

Figure 1 illustrates different cases. Documents A and B have three references in common while papers B and C share just one. In both situations, there is a relationship between the citing documents, although the intensity of that link is higher between A and B (the similarity is higher). Reference D has no relationship with the other documents, because it does not share any cited references. Using social network analysis techniques, the citing documents are represented as nodes and the links between them are based on those relationships that represent similarity among documents. To avoid spurious relationships, a minimum threshold of shared references to make a coupling is established. Analyzing these similarities between documents, it is possible to group them in homogeneous thematic clusters. These clusters are usually related, although the relationships between clusters are weaker than the relationships between papers in a cluster. This technique allows us to describe the knowledge structure of a research field.

This way, we had to make three decisions to carry out the bibliographic coupling. First, we had to elect a measure of similarity. We adopted association strength (van Eck and Waltman, 2009). Second, we chose VOS as the grouping algorithm (Waltman et al., 2010; van Eck and Waltman, 2014). A lot of researchers have corroborated its good results (Kovács

et al., 2015; van Oorschot et al., 2018; Skute et al., 2019). Third, to set a threshold for coupling (citations in common), we followed (Mura et al., 2018). We tested different thresholds and we set it at 18 documents. That was the best solution because of the number of clusters and their internal consistency. Additionally, to simplify the network, we set a minimum degree of two for an article to remain in the network (Vogel and Güttel, 2013). Finally, we analyzed the 131 documents included in the network.

RESULTS

Descriptive Analysis

Figure 2 shows the temporal distribution of published documents since 2004. The number of documents in the period 2004–2020 (until May) was 1,708. According to the evolution of this number, we identify three phases: 2004–2009, 2010–2014, and 2015–2020. The first period (2004–2009) is very incipient, with an erratic pattern of publication. From 2010 to 2014, the number of papers grows significantly, i.e., a consolidating period. The last phase shows an exponential growth of scientific production, confirming the interest of the academic community in the value co-creation phenomenon.

Table 1 includes the 20 most frequent journals in this literature. Considering the full period (2004–2020), the top 4 journals in the ranking are Sustainability, Journal of Business Research, Industrial Marketing Management, and Journal of Service Management. These journals have published around 14% (239) of the documents in our database. We highlight the behavior of Sustainability (indexed in SSCI in recent years, our database only includes papers from this journal at the end of the period), and the Journal of Business Research (in which this topic has occupied a standout place just in the last lustrum). The very different nature of the top four journals is interesting: Sustainability aside, the Journal of Business Research is a generalist business/management publication; Industrial Marketing Management focuses on marketing-related themes; the Journal of Service Management publishes papers centered on the service industry. This heterogeneity is a distinguishing mark of value co-creation literature. In the top 20 journals, the thematic variety is noticeable, particularly the inclusion of several technology and innovation management (TIM) journals. Also, we highlight the presence of information technology (IT) publications, a fundamental facilitator of co-creation, and tourism specialized journals, an industry in which the studied phenomenon performs a leading role. Most of the journals in **Table 1** have published the majority of the documents in the last 5 years (2015–2020), although some of them have behaved differently, without an evident pattern.

Table 2 contains the top 10 WoS categories in the value co-creation literature. We point out that a publication can be in more than one of these categories. For the 2004–2020 period, Business and Management categories are the most frequent. The rest of the categories have a much lower proportion in the database. However, the evolution shows a diminishing tendency of the proportion of documents in Business and Management

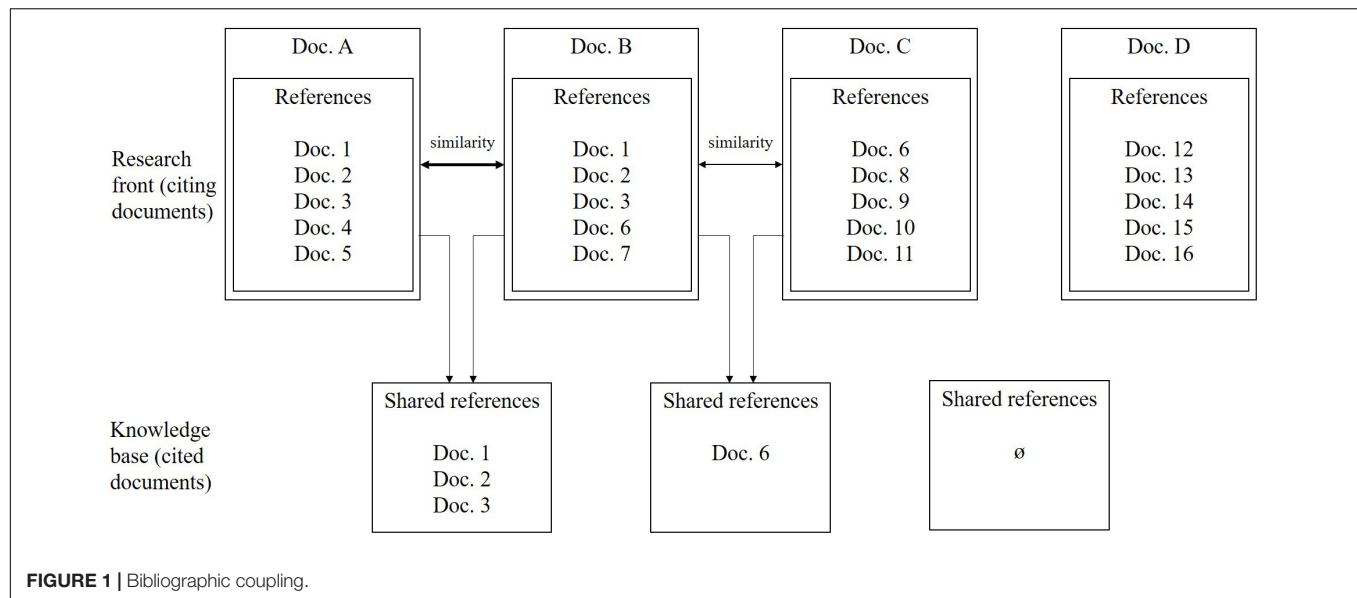


FIGURE 1 | Bibliographic coupling.

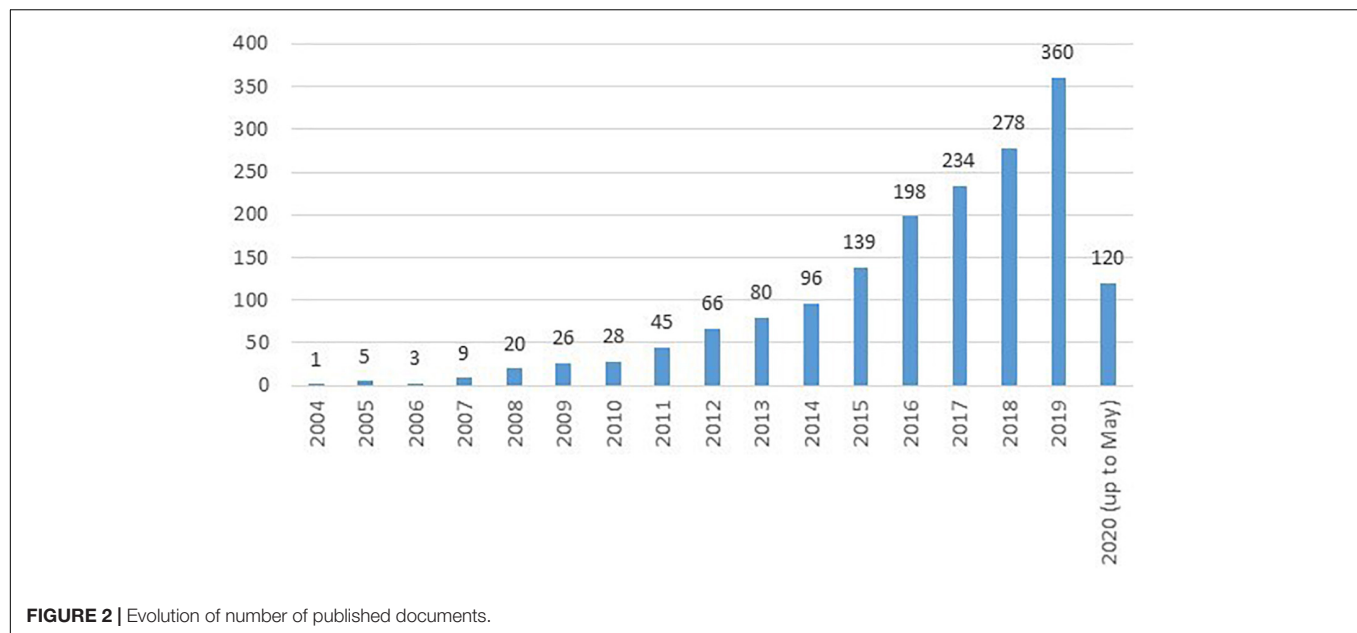


FIGURE 2 | Evolution of number of published documents.

categories whilst Hospitality, Leisure, Sport and Tourism, and Environmental Studies have grown.

In relation to affiliation, the United States and England gather the biggest proportion of papers of our database (**Table 3**), followed by Netherlands, Australia, Germany, China, and Sweden. All of these countries have more than 200 published papers between 2004 and 2020. Some of the countries stand out because of their growth, especially Australia, China, and Italy.

Table 4 includes the institutions where authors in this topic work. Considering the full period, among the top 15 universities, there are four from The Netherlands (Maastricht University, Wageningen University, Delft University of Technology, and Erasmus University Rotterdam), several from the Nordic countries (three from Sweden, Karlstad University, Linköping

University, and Lulea University of Technology, two from Finland, Aalto University and Hanken School of Economics, and one from Denmark, Copenhagen Business School), two from England (University of Manchester and University of Nottingham) and one from Central Europe (University of Innsbruck from Austria). Only Hong Kong Polytechnic University and University of Auckland are from non-European countries. Only the University of Innsbruck exhibits a decreasing behavior. On the contrary, several universities show astonishing growth rates in published documents on the topic.

Table 5 includes the authors who have published six or more papers contained in our database and the number of citations of the documents associated with each author in the WoS database. The first position in this ranking is for professor Edvarsson,

TABLE 1 | Top 20 journals publishing co-creation related documents.

Journal	Last period	Full period
	2015–2020	2004–2020
Sustainability	67	67
Journal of Business Research	59	64
Industrial Marketing Management	45	55
Journal of Service Management	41	53
Journal of Business and Industrial Marketing	28	32
International Journal of Contemporary Hospitality Management	29	30
Journal of Cleaner Production	26	29
Technological Forecasting and Social Change	25	28
Journal of Product Innovation Management	14	26
Journal of Services Marketing	24	26
Journal of Service Research	12	21
European Journal of Marketing	14	20
Service Science	14	19
Journal of Service Theory and Practice	18	18
Service Industries Journal	14	18
International Journal of Information Management	15	16
Computers in Human Behavior	8	15
Creativity and Innovation Management	7	15
International Journal of Hospitality Management	14	15
Journal of Marketing Management	14	14

TABLE 2 | Top 10 WoS categories.

WoS category	Last period		Full period	
	2015–2020		2004–2020	
	Documents	%	Documents	%
Business	484	36.4%	634	37.1%
Management	463	34.8%	633	37.1%
Hospitality, leisure, sport and tourism	113	8.5%	128	7.5%
Environmental studies	118	8.9%	124	7.3%
Information science and library science	95	7.1%	123	7.2%
Environmental sciences	116	8.7%	120	7.0%
Green and sustainable science and technology	109	8.2%	113	6.6%
Engineering, industrial	58	4.4%	89	5.2%
Computer science, information systems	57	4.3%	80	4.7%
Education and educational research	49	3.7%	60	3.5%

from Karlstad University (also in the first place in the institution ranking) who has participated in 19 papers. Professor Witell is in second place (13 papers, Universities of Linköping and Karlstad). Professors Vargo (University of Hawaii at Mānoa) and Füller (University of Innsbruck) occupy the third and fourth places, authoring 12 documents each, although Vargo is the most cited author in the table followed by professors Lusch and Füller.

Table 6 gathers the collaboration statistics, considering authors, countries, and institutions as units of analysis. Focusing on authors, the most frequent kind of collaboration is among two or three researchers. In the last period, we observe noticeable

TABLE 3 | Top 10 countries publishing co-creation related documents.

Country	Last period	Full period
	2015–2020	2004–2020
United States	548	735
England	397	478
Netherlands	187	237
Australia	208	231
Germany	176	211
Peoples R China	186	204
Sweden	160	201
Italy	167	195
Finland	159	192
Spain	128	156

TABLE 4 | Top 15 institutions publishing co-creation related documents.

Institution (Country)	Last period	Full period
	2015–2020	2004–2020
Karlstad University (Sweden)	31	51
Maastricht University (Netherlands)	29	39
Aalto University (Finland)	29	37
Linköping University (Sweden)	27	33
University of Innsbruck (Austria)	8	27
Wageningen University (Netherlands)	17	24
University of Manchester (England)	18	24
University of Nottingham (England)	19	23
Copenhagen Business School (Denmark)	15	23
Hong Kong Polytechnic University (China)	19	22
Hanken School of Economics (Finland)	20	22
University of Auckland (New Zealand)	16	21
Lulea University of Technology (Sweden)	19	21
Delft University of Technology (Netherlands)	19	21
Erasmus University Rotterdam (Netherlands)	16	20

growth in papers signed by three or more authors whilst the number of documents with two or fewer authors has gone down. In relation to countries, the most frequent case is when all the researchers are in one country, although we identify a positive evolution of international cooperation in the topic. Finally, we observe that the most frequent cases with respect to institutions collaborating is one or two. However, the number of cases with two or more institutions collaborating has grown in recent years.

Bibliographic Coupling

Figure 3 represents the network resulting from the bibliographic coupling analysis of 131 documents, following the procedure that we explained previously. As a result, we identify 11 clusters that we have classified in three research streams: (1) Open innovation (**Table 7**), (2) Customer-centric analysis (**Table 8**), and (3) Service ecosystem and service innovation (**Table 9**). This taxonomy derives from two sources. First, the relationship and closeness among topics dealt with by each cluster. We have studied all the documents included in the cluster, assigning a name to every cluster and analyzing the overlaps among them.

TABLE 5 | Main researchers publishing co-creation related documents.

Author (Institution, Country)	Documents	Citations in WoS (of the documents) (20th May, 2020)
Edvardsson, Bo (Karlstad University, Sweden)	19	781
Witell, Lars (Linköping University and Karlstad University, Sweden)	13	533
Vargo, Stephen L (University of Hawai'i at Mānoa, United States)	12	1599
Füller Johann (University of Innsbruck, Austria)	12	1109
Mahr, Dominik (Maastricht University, Netherlands)	10	406
Matzler, Kurt (University of Innsbruck, Austria)	10	719
Patricio, Lia (University of Porto, Portugal)	9	789
Maglio, Paul (University of California at Merced, United States)	9	970
Spohrer, James ('Jim') C (IBM, United States)	8	924
Lusch, Robert F (Arizona University, United States)	8	1277
Parida, Vinit (Luleå University of Technology, Sweden)	8	89
Pitelis, Christos (University of Leeds, England)	8	311
Reynoso, Javier (Tecnológico de Monterrey, Mexico)	8	237
Kristensson, Per (Karlstad University, Sweden)	8	666
Gustafsson, Anders (BI Norwegian Business School, Norway)	8	516
Skalen, Per (Karlstad University, Sweden)	7	500
Lievens, Annouk (University of Antwerp, Belgium)	7	340
McColl-Kennedy, Janet R (University of Queensland, Australia)	7	163
Jaakkola, Elna (University of Turku, Finland)	7	226
Breidbach, Christoph F (University of Queensland, Australia)	7	217
Buhalis, Dimitrios (Bournemouth University, England)	7	406
Sigala, Marianna (University of South Australia, Australia)	6	222
Zhang, Tingting (University of Central Florida, United States)	6	124
Sjödin, David (Luleå University of Technology, Sweden)	6	53
Trischler, Jakob (Karlstad University, Sweden)	6	64
Roberts, Deborah L (University of Nottingham, England)	6	152
Morosan, Cristian (University of Houston, United States)	6	78
Mele, Cristina (University of Naples Federico II, Italia)	6	119
Frantzeskaki, Niki (Swinburne University of Technology, Australia)	6	333
Hutter, Katja (University of Salzburg, Austria)	6	352
Kowalkowski, Christian (Linköping University, Sweden)	6	70
Dey, Bidit L (Brunel University, England)	6	45
Fisk, Raymond P (Texas State University, United States)	6	318

These names appear in **Tables 7–10**, in which we summed up these clusters, along with some measures that complete their interpretation and the color identifying them in the network.

TABLE 6 | Collaboration in co-creation literature.

Authors	Last period		Full period	
	2015–2020		2004–2020	
	Documents	%	Documents	%
1	161	12.1%	227	13.3%
2	322	24.2%	457	26.8%
3	413	31.1%	518	30.3%
4	251	18.9%	296	17.3%
5 or more	182	13.7%	210	12.3%
Countries	Documents	%	Documents	%
1	797	58.9%	1050	60.7%
2	372	27.5%	461	26.6%
3	100	7.4%	123	7.1%
4	30	2.2%	36	2.1%
5 or more	27	2.0%	30	1.7%
Institutions	Documents	%	Documents	%
1	442	31.3%	604	33.6%
2	453	32.1%	589	32.7%
3	253	17.9%	304	16.9%
4	93	6.6%	104	5.8%
5 or more	85	6.0%	99	5.5%

The main topics studied in each cluster appear in the last column. Second, network analysis, which we used to confirm this taxonomy. To do that, we shrank the full bibliographic coupling network, transforming each cluster into just one node, which allows us to measure the intensity of relationships among clusters. Moreover, we used the VOS clustering algorithm to confirm the structure of our proposed research streams. Two of these clusters are disconnected from the main component. We refer to these clusters as new trends in technology and innovation management-related value co-creation literature, based on their composition (**Table 10**).

To analyze the clusters obtained from bibliographic coupling, we calculated different metrics about cluster size (number of documents), date (range of years, most frequent year, and average year of publication), and the scientific impact of the documents (citations per document and *h* index). We worked out the density of the cluster (the average degree of the cluster) to measure the intensity of the relationships among documents included in it, and the centrality (the weighted degree of each cluster in the entire network) to measure the relationship among clusters. We have classified the publishing journals in management, marketing, services, TIM, tourism, information technology (IT), and others, according to their aim and scope and we have identified the main topics in each cluster.

DISCUSSION

We have organized this section around the three research streams that we describe in the network (**Figure 3**): (1) Open innovation, (2) Customer-centric analysis, and (3) Service ecosystem and

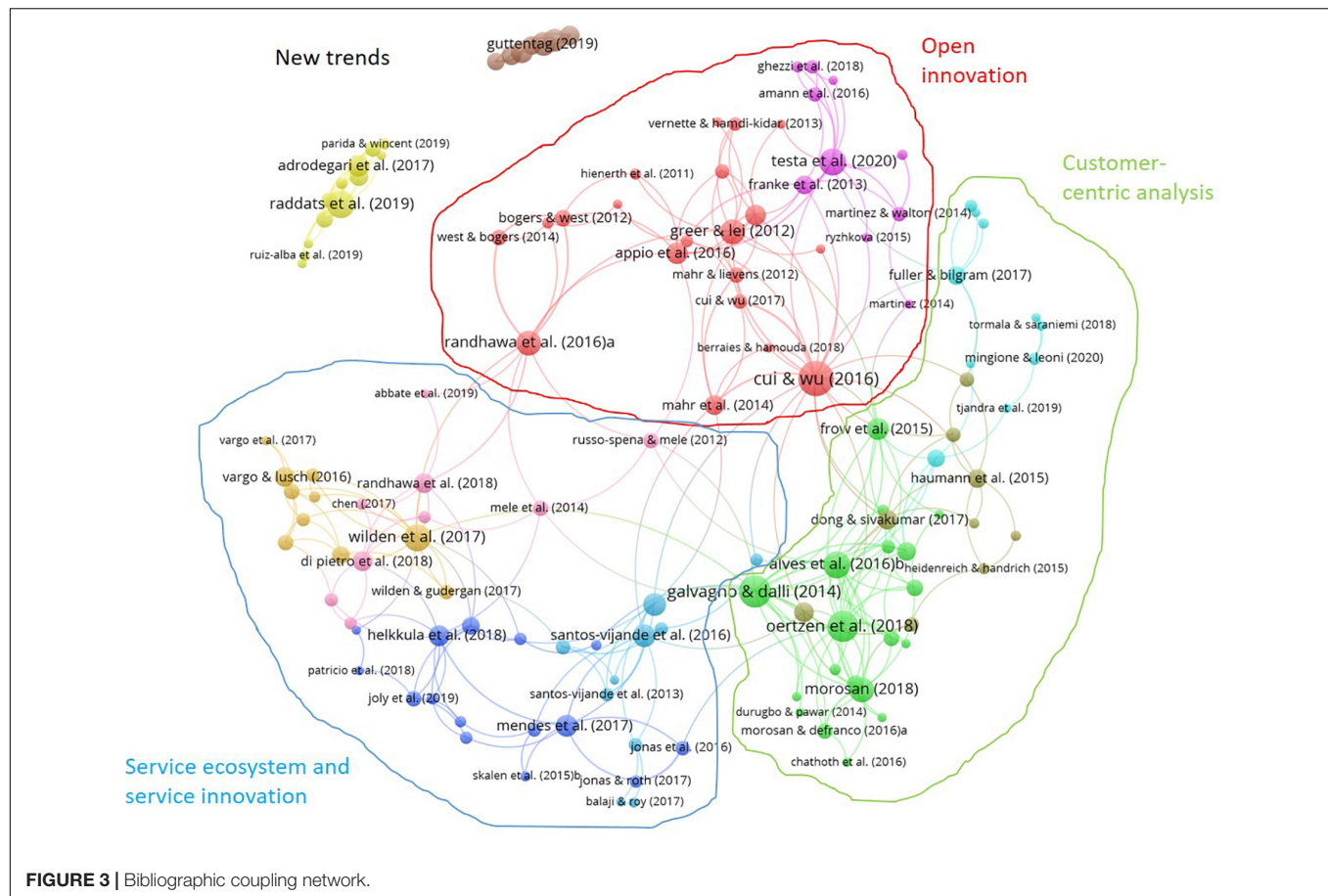


FIGURE 3 | Bibliographic coupling network.

TABLE 7 | Research stream 1: open innovation.

Cluster's name	# docs	Year range/most freq. year/Av. year	# cits. per doc	h ind	Dens/centr	Journal specialization	Main topics
Innovation process and value co-creation (red)	20	2010–2019/2012/2014.35	99.40	15	80.30/1310	TIM (60.0%)	Consumer co-creation in new product development. Customer co-creation and open innovation. User innovation and co-creation.
Crowdsourcing, online communities and open and user innovation (pink)	10	2013–2020/2014/2015.80	21.30	7	60.20/479	Management (30.0%)	Open and user innovation. Crowdsourcing. Online communities. Social media-based innovation. Consumer value creation. Creativity.

service innovation. The first one includes only two clusters, dealing with topics centered on the innovation process. The second research stream, which contains three clusters, analyzes topics related to the role of clients in the innovation. The third line, with four clusters, deals with themes focused on services industries and service innovation. Although all of them are closely related, for the sake of clarity, we analyze them independently. We have included a sub-section to analyze the emerging themes and another for the comparison of our results with previous literature.

Research Stream 1: Open Innovation

The first research stream, Open innovation (Table 7), has received a more intense influence from the technology and innovation management literature. This research stream is

present in other studies of a similar nature (Alves et al., 2016; Greenhalgh et al., 2016), although our study is closer to the innovation field. We find two clusters in this stream: the red one (Innovation process and value co-creation) and the pink one (Crowdsourcing, online communities and open and user innovation). They are located in the top zone of the network (Figure 3).

Innovation Process and Value Co-creation (Red Cluster)

In the red cluster, we can observe the different perspectives from which value co-creation concerning innovation is being studied: marketing, -e.g., service-dominant logic-, organizational behavior, -e.g., communities of practice-, and management, -e.g., dynamic capabilities- (Randhawa et al., 2016), and IT

TABLE 8 | Research stream 2: consumer-centric analysis.

Cluster's name	# docs	Year range/most freq. year/Av. year	# cits. per doc	h ind	Dens/centr	Journal specialization	Main topics
Theoretical issues about value co-creation (green)	19	2014–2020/2016/2016.53	36.05	13	94.63/1271	Management (21.1%); marketing (21.1%)	Definitions, theories and frameworks about value co-creation. Service-dominant logic paradigm. Theory of value co-creation. Perspectives and contexts of co-creation of value in business and management. Co-creation via the internet.
Brand and virtual value co-creation (light blue)	10	2010–2020/2011/2015.60	57.00	5	42.80/336	Marketing (70.0%)	Corporate brand management. Brand value co-creation. Co-creation experience. Multi-stakeholder perspective to brand co-creation. Virtual co-creation.
Co-created services/products and customer satisfaction (gray)	9	2012–2020/2015/2016.22	46.44	7	50.67/504	Marketing (44.4%)	Co-production. Customer participation. Customer co-creation. Customer satisfaction. Tourism services.

TABLE 9 | Research stream 3: service ecosystems and service innovation.

Cluster's name	# docs	Year range/most freq. year/av. year	# cits. per doc	h ind	Dens/centr	Journal specialization	Main topics
Value co-creation in service innovation ecosystems (marine blue)	15	2015–2019/2017/2016.80	24.47	9	54.00/662	Service (73.3%)	Service innovation ecosystem. Service design. Stakeholders in service innovation upon the co-creative paradigm. Value co-creation factors in service innovation.
Innovation, customer participation and performance (medium blue)	10	2012–2019/2013/2016.00	35.50	8	56.40/499	Marketing (70.0%)	Firm's innovation capabilities. Ability to create value (performance and co-creation). Ability to create value for customer. Firm's performance. Employees' collaboration co-creation. Experience co-creation.
Service-dominant logic and value co-creation (orange)	10	2016–2018/2017/2016.90	89.70	9	78.40/586	Service (40.0%)	Service-dominant logic. Strategic approaches for service-dominant logic. Actors and service ecosystem. Coordination and cooperation involved in the co-creation of value. Business model.
Service innovation/value innovation (light pink)	9	2012–2019/2018/2016.22	58.67	6	43.56/504	Service (55.6%)	Service innovation. Open service innovation. Value innovation. Open/co-created process. Open innovation and knowledge co-creation. Digital service platforms.

TABLE 10 | New trends in technology and innovation management-related value co-creation literature.

Cluster's name	# docs	Year range/most freq. year/av. year	# cits. per doc	h ind	Dens/centr	Journal specialization	Main topics
Servitization (yellow)	12	2015–2020/2019/2017.83	13.58	8	89.00/n.a.	Management (50.0%); marketing (50.0%)	Servitization. Productization. Business model. Value co-creation capability.
Sharing economy and tourism industry (brown)	7	2019–2020/2019/2019.29	6.86	4	148.57/n.a.	Tourism (100.0%)	Sharing economy model. Hospitality and tourism management. Innovations in the tourism sector. Peer-to-peer (P2P). Airbnb

(Greer and Lei, 2012). In these studies, we have found two different levels of analysis: individual customers/users and customers/users associated with a company (Greer and Lei, 2012). An interesting topic included in this group is the study of customer co-creation during the innovation process as a major source for firms' competitive advantage (Mahr et al., 2014). In this stream, we find concepts very similar to value co-creation:

network collaboration, community innovation (West and Bogers, 2014), the creation of innovation-related knowledge in virtual communities (Mahr and Lievens, 2012) and the innovative brand community (Parmentier, 2015).

The red cluster is the oldest in the network. This fact explains, at least partially, why it is the group with the best performance in impact metrics (*h* index and citations per document). The

inclusion of several literature reviews justifies the high number of citations and the variability among documents. Its density, one of the biggest, implies the strong connection among the documents included in the group. This is coherent with the homogeneity of the journals that have published these documents: 60% of the group has been edited by a TIM journal. This is the most central group, coherent with the nature of our database. In this sense, although a lot of these documents are published in journals of different specialties (management, service, marketing, and among others), it seems logical that all the papers in our database cite (with more or less frequency), seminal papers in this literature, most of them published in TIM journals. Finally, the average publication year does not imply, in this case, a process of abandoning this research line, because even though there are several papers published at the beginning of the analyzed period (Hoyer et al., 2010; Greer and Lei, 2012; Mahr and Lievens, 2012), there are some papers that have been edited recently (Cui and Wu, 2017; Morgan et al., 2018, 2019).

This cluster includes 20 documents (it is the biggest one) that deal with two main topics. Some of them focus on the involvement of customers in the new product development process (Hoyer et al., 2010; Greer and Lei, 2012; Mahr and Lievens, 2012; Cui and Wu, 2017; Morgan et al., 2018, 2019). The other subgroup of documents starts from the open innovation paradigm, approaching ideas like open service innovation (Randhawa et al., 2016), entrepreneurial orientation, market orientation, and resource orientation (Cheng and Huizingh, 2014), and user-centric value creation processes (Hienerth et al., 2011).

Crowdsourcing, Online Communities and Open and User Innovation (Pink Cluster)

The pink cluster includes papers that analyze open and user innovation (Amann et al., 2016), online communities (Testa et al., 2020), and crowdsourcing (Franke et al., 2013; García Martínez and Walton, 2014; Faullant and Dolfus, 2017; Ghezzi et al., 2018). The works in this cluster highlight the role of the consumer in the innovation process (García Martínez, 2014), especially the importance of the user's or client's creativity for innovation (Testa et al., 2020). Franke et al. (2013) comment that thanks to the Internet, new organizational forms have been created to integrate users into business innovation. There is a growing interest in online communities as a channel of innovation for businesses (García Martínez, 2015; Amann et al., 2016) and as an important source of knowledge and new ideas (García Martínez and Walton, 2014). Ryzhkova (2015) confirms the importance of collaboration with customers, supported by information and communication technology (ICT), for the innovation performance of companies.

Crowdsourcing is the other big pole of attraction in this cluster. For Ghezzi et al. (2018), this phenomenon is rooted in two main disciplines within the broader theme of innovation and management: (1) open innovation; and (2) co-creation. Faullant and Dolfus (2017) commented that virtual crowdsourcing initiatives, and in particular crowdsourcing competitions, are a means of harnessing users' creativity to aid corporate innovation. Crowdsourcing can be considered as a source of innovation and creativity (García Martínez, 2015) and as a tool for

data analysis that helps to manage "Big Data" in companies (García Martínez and Walton, 2014).

This cluster is closely related to the "Innovation process and value co-creation" one, although its characteristics are completely different. It has a lower number of citations per document than other groups with similar average publication dates although its *h* index is better. Also, it is remarkable that in the last 2 years, just one paper included in this group has been published. All these data together point to this group having less potential than others in this literature. The density of this group implies a moderate connection between papers, which is coherent with the variable nature of the publications that have edited these documents. The most frequent journal category is management with 30% of documents, followed by TIM with 20%. Its centrality is also modest, with a strong connection only with the other cluster in this research stream.

Research Stream 2: Customer-Centric Analysis

In this research stream (Table 8), we find three clusters that analyze topics related to different facets of the consumer/user: satisfaction, engagement, and participation, among others. These clusters are the green one (Theoretical issues about value co-creation), the gray one (Co-created services/product and customer satisfaction), and the light blue one (Brand and virtual value co-creation). This research stream occupies the right side of the network.

Theoretical Issues About Value Co-creation (Green Cluster)

The green cluster includes 19 documents that establish conceptualizations (Ramaswamy and Ozcan, 2018) and theoretical frameworks for this literature, in a general context (Martínez-Cañas et al., 2016; Chen et al., 2017), as well as in specific ones. For example, Oertzen et al. (2018) propose a model for services, while Chathoth et al. (2016) and Hamidi et al. (2020) focus on tourism. Some of them include a literature review (Baron et al., 2014; Bharti et al., 2015; Chathoth et al., 2016; Oertzen et al., 2018) and others use bibliometric techniques (Galvagno and Dalli, 2014; Alves et al., 2016). Although this cluster has a more intense link with the other clusters included in its research stream, it has connections with all the clusters, due to its more generic nature (in this field).

In this group, we find works that consider that value co-creation represents a critical element of the service-dominant logic paradigm (Baron et al., 2014; Morosan and DeFranco, 2016; Morosan, 2018). Other authors consider theories such as the theory of value co-creation (Galvagno and Dalli, 2014), the theory of service co-production, and some models of theory-building approach (Grace et al., 2019). Also, we find the work of Galvagno and Dalli (2014), which presents three perspectives of literature study on co-creation: service science, innovation and technology management, and marketing and consumer research.

Some works in this group highlight perspectives and contexts of the usage of the term value co-creation in business and management fields. Also, this group focuses on diverse approaches and areas that study co-creation. For example,

Alves et al. (2016) consider value co-creation as a driver of business innovation, the development of new products and services, the experience of consumers of brands, and the co-creation process. In some cases, innovation appears in theoretical models as a perspective for the study of value co-creation or as a factor (Durugbo and Pawar, 2014; Jouny-Rivier et al., 2017). Among these works, we highlight the study of Bharti et al. (2015) that identifies 27 elements of co-creation classified into five categories: process environment, resource, co-production, perceived benefits, and management structure.

Papers in this cluster have an average of 36.05 citations. Most of the documents are relatively recent (in fact, all of them were published after 2014), which explains the low impact metrics, at least partially. However, it is remarkable that although the number of citations per document is much lower than other clusters (for example, the red cluster), its *h* index is 13. This means there is less variability in the impact of documents that form the cluster. With one exception, this group has the highest density, which implies the biggest number of shared references among papers in the cluster, thus the biggest proximity among topics. However, this fact contrasts with the variability in the specialty of the journals that have published these documents: the two biggest groups are management and marketing, with 21.1% of the documents. Service and tourism are also important categories in this group. This diversity explains the high centrality of the cluster, the second-highest overall.

Co-created Services/Products and Customer Satisfaction (Gray Cluster)

In close proximity to the green cluster, the documents that comprise the gray cluster deal with topics related to customer satisfaction (Grissemann and Stokburger-Sauer, 2012; Haumann et al., 2015; Heidenreich et al., 2015). Most of the articles in this group analyze co-creation in the service context, with special attention to the tourism industry and technology-based services (Heidenreich and Handrich, 2015; Stokburger-Sauer et al., 2016; Dong and Sivakumar, 2017; Sarmah et al., 2017; Kamboj and Gupta, 2020).

Dong and Sivakumar (2017) analyze customer participation, customer commitment and customer innovation as related but distinct concepts. Starting from a vision of customer participation in services, Blinda et al. (2019) classify the characteristics of the participation process as experience-oriented versus results-oriented. Kamboj and Gupta (2020) mainly examine the customer perspective on service innovation. Authors such as Heidenreich and Handrich (2015), Sarmah et al. (2017), and Kamboj and Gupta (2020) consider the basic technology-based service adoption model applied to the tourism sector and study the impact of innovation, the willingness to co-create, the need for interaction and its effect on results (adoption intent and customer satisfaction).

Another term that appears in this group is co-production, which is considered a component of value creation, offering many benefits for customers and management, but also requiring customers to invest a considerable amount of time and effort (Stokburger-Sauer et al., 2016). Haumann et al. (2015) comment that little is known about the strategies that companies can

employ to positively influence customer perceptions of co-production processes.

This cluster has a moderate number of citations per document but a better *h* index that implies a more homogenous impact of the papers included in it. The documents of this cluster are published by a blend of marketing, service, and tourism journals, as a consequence of a variety of topics. Its low-density figure points to a moderate connection among the documents. The moderate centrality also implies a low-intensity link with other groups. Although its average publication year is 2016.22, there is a high dispersion of articles along the considered period. We have to highlight that this group includes two papers published very recently (Blinda et al., 2019; Kamboj and Gupta, 2020).

Brand and Virtual Value Co-creation (Light Blue Cluster)

The light blue cluster has two subgroups: one group around the research of Füller and Bilgram (2017) and another group around the work of Ramaswamy and Ozcan (2016). The first subgroup analyzes virtual co-creation platforms and the co-creation experience (Füller et al., 2011; Kohler et al., 2011; Füller and Bilgram, 2017). This subgroup is very close to the first research stream, as we can see in the network, sharing some topics. The other subgroup focuses on brand value co-creation (Hsieh and Chang, 2016; Ramaswamy and Ozcan, 2016; Tormala and Saraniemi, 2018; Mingione and Leoni, 2020) and corporate brand management (Schmidt and Redler, 2018). This cluster considers specifically the role of other stakeholders in the co-creation process.

Digging deeper in the first subgroup, around the central concept of virtual co-creation, Füller et al. (2011) analyze 'virtual design skills' as a means to develop the innovation process and enrich companies. Kohler et al. (2011) emphasize the importance of experience in fostering active participation in innovation tasks. Virtual co-creation is considered a viable strategy for developing consumer-centered products in the digital age (Füller and Bilgram, 2017).

In the other part of this cluster, Ramaswamy and Ozcan (2016) present an integrative framework for brand value co-creation. They describe how brand engagement platforms work, their different functions and roles, and how they connect companies to stakeholders. Hsieh and Chang (2016) propose an integrative theoretical framework to synthesize perceived psychological benefits and distinctive motivations in the brand co-creation process. Schmidt and Redler (2018) analyze corporate brand management from a strategic perspective. Tormala and Saraniemi (2018), Tjandra et al. (2019), and Mingione and Leoni (2020) provide a multi-stakeholder perspective for brand co-creation and analyze the co-creative actions of the corporate brand.

This cluster contains three papers from 2010 and 2011 with the rest of the documents published in 2016 or after. This bipolarity explains its low density (the lowest). Also, the cluster has a moderated centrality, with strong connections to the green cluster ("Theoretical issues about value co-creation") especially with the group around Ramaswamy and Ozcan's (2016) work, and to the red and pink clusters (more focused

in TIM), through Füller and Bilgram's (2017) research. This division is also noticeable in the journals that have published the documents, with a bigger group concentrated in marketing related publications, and the other without a clear specialty. Although 70% of the documents in this group are in marketing-related journals, this trend is more noticeable in the subgroup that deals with brand value co-creation. We can observe a high dispersion in several characteristics: the year of publication that ranges from 2010 to 2020 and a higher number of citations per document but a smaller *h* index, which implies that a significant proportion of citations are concentrated in just a few of the papers in the group.

Research Stream 3: Service Ecosystems and Service Innovation

On the left side of the network, we find four clusters that constitute the third research stream (Table 9): service ecosystems and service innovation. We have called these clusters "Value co-creation in service innovation ecosystems" (marine blue), "Innovation, customer participation and performance" (medium blue), "Service-dominant logic and value co-creation" (orange), and "Service innovation/value innovation" (light pink). All of them deal with topics related to value co-creation in services, analyzing themes like service design, stakeholders in service innovation, or service innovation ecosystems.

Value Co-creation in Service Innovation Ecosystems (Marine Blue Cluster)

All the documents in the marine blue cluster deal with different facets of service innovation. In the group, we find several conceptual studies (Skalen et al., 2015; Foglieni and Holmlid, 2017; Mendes et al., 2017; Helkkula et al., 2018; Yu and Sangiorgi, 2018; Joly et al., 2019), some case studies that analyze the role of different agents in service innovation (Karlsson and Skalen, 2015; Chew, 2016; Jonas et al., 2016), and works that explore service innovation in the health industry (Beirao et al., 2017; Jonas and Roth, 2017; Patricio et al., 2018).

This group of studies highlights the different fields that have contributed to the analysis of customer value co-creation in service innovation (Jaakkola et al., 2015; Chew, 2016; Joly et al., 2019). Starting from this multidisciplinary, but always focused on service innovation, the documents included in the cluster have analyzed different issues: service experience co-creation (Jaakkola et al., 2015), the relationship between value co-creation and service evaluation (Foglieni and Holmlid, 2017), and the role of different stakeholders (Karlsson and Skalen, 2015; Akesson et al., 2016; Jonas et al., 2016; Jonas and Roth, 2017).

Yu and Sangiorgi (2018) state that "Service design, as a human-centered and creative approach to service innovation, can reframe new service development processes to implement value co-creation." This is evident in healthcare services (Beirao et al., 2017; Patricio et al., 2018) and medical appliances (Jonas and Roth, 2017).

This cluster is the biggest in this research stream, contains 15 papers, and has a clear specialization in service-related publications (73.3% of documents were published in journals related to this topic). This is the most central cluster in this

research stream, which is consistent with the more conceptual nature of several documents it includes. Its combination of high *h* index (9) with low citations per document (the lowest in the group) is due to some of the studies being very recent while others have been highly cited in this context.

Innovation, Customer Participation, and Performance (Medium Blue Cluster)

The medium blue cluster contains several documents analyzing different issues that link co-creation with performance (O'Cass and Ngo, 2012; Zhang et al., 2015; Santos-Vijande et al., 2016; Anning-Dorson, 2018). Some of them also focus on innovation (Ngo and O'Cass, 2013; Santos-Vijande et al., 2013; Kautish and Sharma, 2019). This diversity found a shared point in the service industry, with 80% of the papers analyzing it.

Santos-Vijande et al. (2013) investigate the relationship between innovative culture, innovation efforts and performance in knowledge-intensive business services (KIBS). Santos-Vijande et al. (2016) note that from a service-dominant logic perspective, employees are operational resources that companies can consider to improve innovation results. Anning-Dorson (2018) analyzes the influence that customer participation capacity has on the performance of service companies and considers that innovation has a mediating effect on this relationship. O'Cass and Ngo (2012) and Ngo and O'Cass (2013) study the effect of innovation and client engagement on performance and competitive advantage.

This cluster has a consistent evolution during the period, with papers published from 2012 to 2019. Also, even though the number of citations per document is not very high, its *h* index is remarkable, which implies less variability in the citations among papers. There is a clear specialty, with 7 of the 10 papers forming the cluster published in marketing-related journals, although most of them deal with service industries. The moderated density points to a weaker relationship among papers in the cluster as the medium centrality implies there are not intense connections with other groups, although some papers, specifically Santos-Vijande et al. (2016, 2018) are connected with several clusters. The consistency of the group suggests a good potential for development.

Service-Dominant Logic (Orange Cluster)

Most of the documents in the orange cluster focus on this topic. Among all the works that make up this group, Vargo and Lusch's (2016, 2017) research stands out, introducing the concept of "service ecosystems." These theoretical documents try to consolidate the bases for the development of this theory in the marketing area.

Service-dominant logic emerged more than a decade ago as a potential framework for addressing the role of service in exchange and value creation (Vargo and Lusch, 2017; Wilden et al., 2017). From this perspective, the absence of coordination and cooperation mechanisms involved in value creation can be observed, but the concept of the service ecosystem can be included as a new axiom, focusing on the role of institutions and institutional arrangements in value creation systems (Sitaloppi et al., 2016; Vargo and Lusch, 2016). Polese et al. (2018) present an integrated model, the so-called intelligent service ecosystem

that can be applied to hyper-competitive and experience-based sectors and that explores the main elements-steps to manage and optimize value co-creation and long-term sustainability and, therefore, to move from innovation to social innovation.

This cluster has high density (which implies a strong connection among its components) and moderate centrality (with just a few connections to other clusters). The impact metrics are notable, in the number of citations per document as well as in the *H* index. Also, although this group is relatively young (2016.8), we have to highlight the concentration of all the documents included in the cluster in 3 years: from 2016 to 2018. The kind of publication that has edited the papers is a mix of service and marketing. The presence of professors Vargo and Lusch (Lusch et al., 2016; Vargo and Lusch, 2016, 2017) in several of these documents is also significant, although the research of professor Wilden (Ralf and Siegfried, 2017; Wilden et al., 2017) is the main link of this group with others, especially with the marine blue cluster.

Service Innovation/Value Innovation (Light Pink Cluster)

We refer to the light pink cluster as “Service innovation/value innovation” because most of the documents revolve around these topics (Mele et al., 2014; Lusch and Nambisan, 2015; Koskela-Huotari et al., 2016; Chen, 2017; Wallin and Fuglsang, 2017; Di Pietro et al., 2018; Randhawa et al., 2018). Russo-Spena and Mele (2012) approach innovation as a co-creation process from a practice-based vision and develop the five “Co-s” model. In a similar line, Mele et al. (2014) offer a framework for innovation. It is based on the comparison of the three research approaches: (1) goods-dominant logic (development of new products and services and the company as the main actor); (2) resource-based approach (innovation drivers such as knowledge, skills and relationships); (3) service-dominant logic (“open” innovation processes in which all network actors can mobilize and integrate their resources to become value co-innovators).

Lusch and Nambisan (2015) develop a framework of analysis for service innovation based on three pillars: (1) service ecosystems; (2) service platforms; and (3) value creation. Chen (2017) analyses service innovation in different service providers and, from the service-dominant logic perspective, presents four models of service innovation development: ICT platforms, customer relationship management systems, community trading services and multi-channel services. Randhawa et al. (2018) examine how intermediaries in general, and those with digital service platforms specifically, engage with customers to help them innovate their services within their service ecosystem. Abbate et al. (2019) analyze how open innovation digital platforms function as “co-creating intermediaries” that define, develop and implement dedicated processes, specific tools, and appropriate services to support knowledge co-creation activities.

The concentration of documents in service-related journals (55.6%) reflects a more focused approach to service topics. The cluster density points to a weaker connection among the components of the cluster. Also, there is a higher dispersion in the number of citations, as we can observe in citations per document and *h* index figures. The moderate centrality also implies a

low-intensity link with other groups, although we can observe some relationship to the orange (“Service-determinant logic”) and blue marine clusters. Its average publication year hides that papers have been published throughout the period. Some recently published documents point to the vitality of the topic (Di Pietro et al., 2018; Randhawa et al., 2018; Abbate et al., 2019).

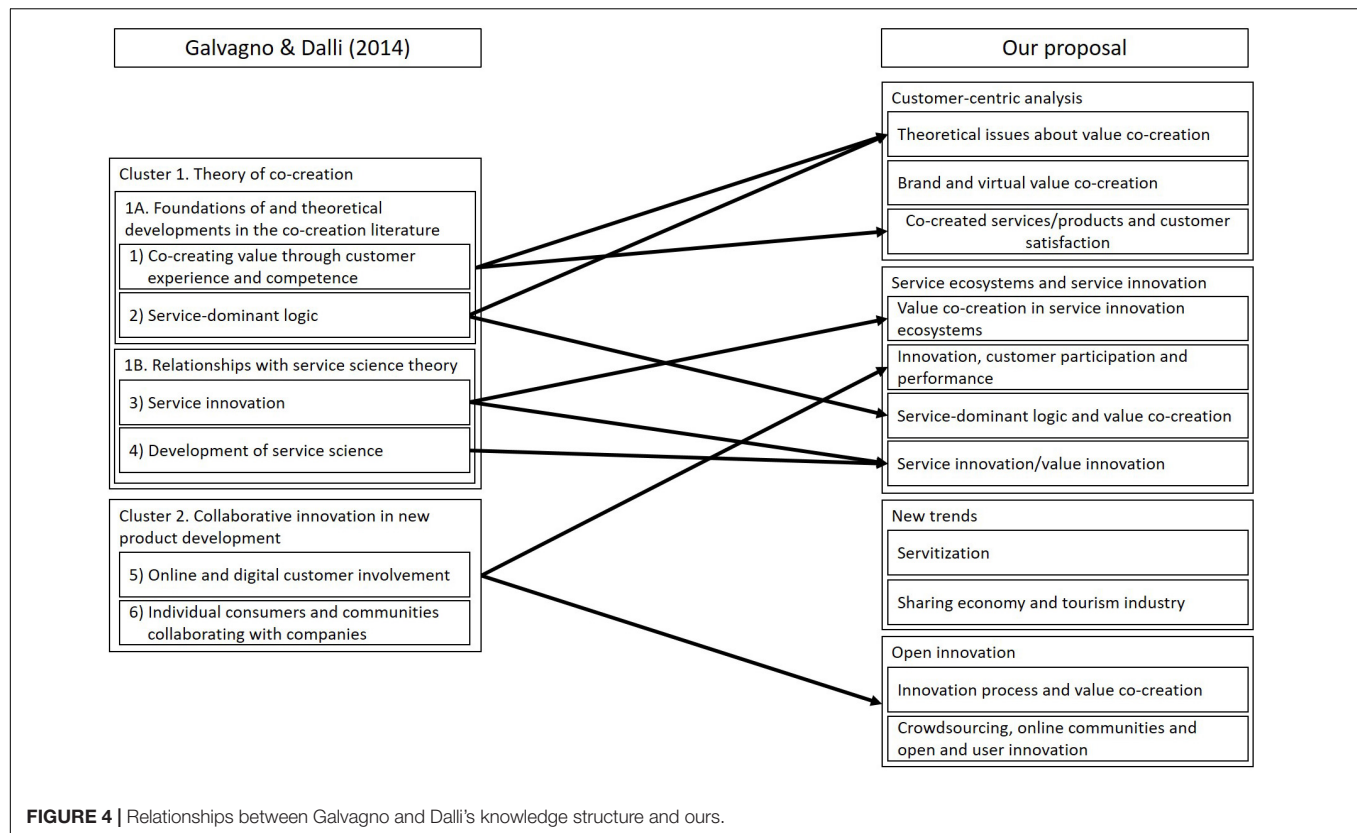
New Trends in Technology and Innovation Management-Related Value Co-creation Literature (Yellow and Brown Clusters)

Finally, the yellow and brown clusters are separated from the network, which implies that their relationship with the rest of the clusters is weaker (Table 10). In this situation, calculating centrality does not make sense. Moreover, they are the most recent groups. We have named the yellow cluster “Servitization” because all the documents this group contains deal with this topic. We have found several conceptual papers (Huikkola and Kohtamäki, 2017; Palo et al., 2019; Raddats et al., 2019; Ruiz-Alba et al., 2019) and some case studies (Windahl, 2015; Windler et al., 2017) that contribute to set the fundamentals of this literature. This cluster has a high density, which implies that papers comprising it have a strong connection. The twelve papers that form this cluster are published only in journals specialized in management and marketing. This literature shows a high-potential of growing in the next several years.

Several of the works in this group conceptualize the term servitization. Story et al. (2017) note that “servitization involves manufacturers developing service offerings to increase revenue and profits and include customers, co-creating innovation as advanced service capabilities for each player.” Raddats et al. (2019) explain that “servitization describes the addition of services to manufacturers’ core product offerings to create additional value for the customer.” Also, Palo et al. (2019) extend the “conceptualization of servitization as a bottom-up, emergent and iterative process of business model contestation.” One of the most recent works introduces the analysis of productization (Li et al., 2020) into this group.

With a more specific focus, Parida and Wincent (2019) relate the concepts of sustainability, business models, innovation, and networks to examine new trends in digitization, the circular economy, and servitization. Ruiz-Alba et al. (2019) study, from the client’s perspective, the moderating role of co-creation in the implementation of servitization strategies and its effects on performance.

The brown cluster is completely specialized in tourism, with 100% of papers published in journals related to this topic. We have called it “Sharing economy and tourism industry.” Some of these works focus on the sharing economy and peer-to-peer (Altinay and Taheri, 2019; Tang et al., 2019; Belarmino and Koh, 2020). Airbnb is the case study for some papers in this cluster (Dann et al., 2019; Guttentag, 2019; Zhang et al., 2019). All the papers in this group have been published in 2019 and 2020, which explains why the impact measures of this cluster are the lowest. The other characteristic that is remarkable in this group is that it is the densest one, which implies the strongest connection



between the papers that are included in it. This cluster has a high potential for developing in the next several years.

In this group, value co-creation is considered as an element within the sharing economy. Hossain (2020) reviews the existing literature on the sharing economy and shows how sharing economy companies operate novel business models with unique revenue streams. This study points out the economic, social and environmental impacts of the sharing economy. Altinay and Taheri (2019) review and synthesize recent studies in the sharing economy literature and identify the knowledge gap and future opportunities for researchers, especially as applied to the tourism sector.

Comparison With Previous Literature

Galvagno and Dalli (2014) pointed out that the TIM perspective was underdeveloped. Our study has focused on that perspective in the last 10 years. We present a map with the main research streams in this literature. Specifically, we find three research streams: “open innovation,” “consumer-centric analysis,” and “service ecosystem and service innovation.” Also, we observe two emerging trends that we have called “servitization” and “sharing economy.”

Although our focus is narrower than Galvagno and Dalli's work, our results are comparable because technology and innovation are issues that permeate the value co-creation literature. In **Figure 4**, we have represented the main relationships between this model and ours. Although these results emerged from the analysis of the literature from 2000

till 2012, we found a strong correspondence between both knowledge structures. The main differences are due to the evolution of the topics. However, we can affirm that both structures shared several elements in common. Cluster 2 in Galvagno and Dalli's proposal (collaborative innovation in new product development) has remained a research stream, although some of the topics are analyzed from the services perspective, the main field in value co-creation in recent years. Also, we observe a trend to blend issues. Service-dominant logic has become the most referenced framework in value co-creation, being one of the basic pillars in documents more related to marketing as well as in those more focused on services.

Another interesting issue emerges from the comparison of both models: although value co-creation is not an exclusive phenomenon in service industries, in recent years, the majority of studies have focused on this kind of industry. Public services, health-care, and especially tourism have gathered the attention and effort of researchers in value co-creation. We identify a cluster oriented completely to services and new trends that, in different ways, consider services as a main component.

Galvagno and Dalli (2014) observe two levels of analysis in co-creation studies: company and customer. We have found that in recent years, although some studies consider a company-level analysis, most of them have focused on a customer experience-centered perspective. This is noticeable in all the literature but especially in the “consumer-centric analysis” research stream and in the pink cluster “crowdsourcing, online communities and open and user innovation.” The “service ecosystems and

service innovation” research stream is more heterogeneous, with some of the groups focused on companies’ performance and innovation systems. The red cluster “innovation process and value co-creation,” included in the “open innovation” research stream, also deals with this perspective.

CONCLUSION

In the introduction, we laid out several research objectives. The first refers to the development and social structure of the value co-creation literature. The bibliometric analysis has revealed some interesting conclusions. The exponential growth in scientific production, especially in the last 5 years, confirms the interest of the academic community in the value co-creation phenomenon.

This scientific production has spread in publications addressing diverse themes. Initially, most of the research papers were published in management and business journals (according to WoS categories). Evolution has modified this trend, incorporating new and different publications. The analysis shows the importance of marketing and TIM journals. However, in recent years, the services field is the biggest pole of attraction for this literature.

European universities have stood out. Several of the most prolific authors (Edvardsson, Witell, Vargo, and Füller) are working for European universities and, in particular, for institutions from Netherlands, Nordic countries, England, and Central Europe. Karlstad University, Linköping University, and Innsbruck University have very active teams working on this topic.

Regarding collaboration, we observed a noticeable growth in papers signed by three or more authors in the last 5 years. This fact fits with the topic’s evolution toward maturity. The affiliations of co-authors also reflect this cooperation. Association among researchers of the same country is the most frequent situation, but documents involving researchers from different nations are habitual.

To complete the second goal, we have mapped the structure of knowledge of value co-creation in the TIM field. We have delimited three research streams, which are the backbone of the knowledge structure of value co-creation in the TIM context: Open innovation, Customer-centric analysis, and Service ecosystem and service innovation. We have found strong links among them, and specifically among the clusters that form them.

The first research stream, Open innovation, includes two thematic clusters that deal with topics like innovation process, crowdsourcing, and online communities and their role in user innovation. The documents with the most significant influence in the TIM field are in this line. Open innovation and new product development have been central themes, and more specific issues have appeared in recent years. Several papers in this stream constitute a basic pillar of this literature.

The Customer-centric analysis research stream deals with value co-creation from the marketing perspective. Innovation is present but combined with specific theories of value co-creation. Customer satisfaction, participation, corporate

brand management, or co-production experience are some of the topics that have developed in this line.

The third research stream, Service ecosystems and service innovation, includes the papers that analyze value co-creation from the service perspective. In this stream, the Service-dominant logic paradigm acquires a superior dimension, becoming a central theory in this field. Service innovation is the main studied concept. Aspects such as the process, the actors, the capabilities to create value, or the service design, among others, form this line, the most active of the three. The growing maturity of the topic has driven it to analyze more specialized issues. The comparison with previous knowledge structures in this field shows that the main research streams remain but with more and more specialized groups inside of them.

From a general point of view, the customer retains the central role in value co-creation. Thus the marketing field is one of the main poles of attraction for researchers in this concept. However, two circumstances have modified this panorama in recent years: first, the growing interest of researchers in services in this topic. Considering that services and marketing are complementary issues, we have to highlight the higher intensity of the presence of researchers, publications, and issues related to service industries. One of the research streams focuses on service issues. Second, the introduction of other relevant agents in co-creation literature is more common in recent years, especially for employees.

The analysis has let us identify some emerging topics and some future research lines. In the first research stream, Open innovation, we have to highlight the research of the involvement of customers in new product development. This research is incorporating new measures for process performance or involvement/participation, and considering more complex variables and models, like the type of customers, the optimum level of involvement, or search and coordination costs of the process. In a more specific context inside this research stream, the research of Ghezzi et al. (2018) in crowdsourcing and the work of Testa et al. (2020) in social media-based innovation identify several research gaps that will focus the effort in this topics in coming years.

In the Customer-centric analysis research stream, we have found some topics that are gaining interest. We have to highlight the issues around corporate brand value co-creation. Also, the analysis of the role of intermediaries in the value co-creation process, connecting customers with companies, is another specific theme that is growing in the field. Other ways to get this participation and the implications of use (e.g., apps) have to be explored further in the future.

The Service ecosystems and service innovation research stream has been the most active in recent years. Several works have pointed to some of the main topics to analyze in the coming years. Service-dominant logic has played an essential role in this field and remains one of the poles of attraction for this literature. Vargo and Lusch (2017) have done an excellent job organizing these works and establishing future research lines. Service design is another leading topic in this stream. Helkkula et al. (2018) suggest a future research agenda around service innovation.

Two emerging themes join these research lines: servitization and sharing economies. Academics have focused on these topics

in the last several years. Raddats et al. (2019) and Hossain (2020) outline comprehensive reflections about the evolution of these themes. All these conclusions reinforce the growing prominence of the service field in the value co-creation arena.

From a theoretical point of view, our study offers three principal contributions. First, we have given a dynamic image of the field in recent years, describing the activity in it, characterizing the most usual journals publishing this literature, and gathering the main actors working in it (authors, institutions, and countries). All of it assesses the importance of the topic and maps its social structure.

Second, we have studied the different topics in this literature, describing its knowledge structure. For each thematic group, we have characterized its role in the literature and its evolution. We have compared our results with previous studies to figure out how some themes have remained over time while others have disappeared.

Third, we have delimited two emerging themes and several future lines for each research stream. The academic community should consider our proposals for addressing in depth the joint analysis of value co-creation and TIM. On the other hand, our study should be useful for researchers focused on the service industries, such as tourism, public services, or health care.

From a practical perspective, our study has another three implications. First, this paper assesses the dimension of value co-creation in the business context. This phenomenon has become a competitive necessity in some industries. Co-creation is essential to deliver services that day by day are growing, not just in service-related industries. Managers should consider value co-creation as a priority on their agenda.

Second, this literature highlights the role of the customer from a more general point of view. Clients have assumed new roles. Now, they are innovators, information sources, co-producers, communicators, and even more. Companies have to learn what kind of customers could play those roles, how to manage each one of these functions, and how much participation is optimum for the company. Managers have to respond to all of these questions as soon as possible.

Third, we have identified the service industry as one of the most relevant in the value co-creation process. In tourism, public, and health care services industries, the value co-creation has grown exponentially in the last few years.

REFERENCES

- Abbate, T., Codini, A. P., and Aquilani, B. (2019). Knowledge co-creation in open innovation digital platforms: processes, tools and services. *J. Bus. Ind. Mark.* 34, 1434–1447. doi: 10.1108/JBIM-09-2018-0276
- Aghdam, A. R., Watson, J., Cliff, C., and Miah, S. J. (2020). Improving the theoretical understanding toward patient-driven health care innovation through online value cocreation: systematic review. *J. Med. Internet Res.* 22, 1–14. doi: 10.2196/16324
- Akesson, M., Skalen, P., Edvardsson, B., and Stalhammar, A. (2016). Value proposition test-driving for service innovation how frontline employees innovate value propositions. *J. Serv. Theory Pract.* 26, 338–362. doi: 10.1108/JSTP-10-2014-0242

Interaction with customers in the design or production of services has become essential for companies in these industries. Our study has shown some of the questions that these companies have to address.

Finally, this study is not free of limitations. As we mentioned in the methodological section, the use of the bibliographic coupling technique implies decisions that influence the final result. Although we have checked that our sample is representative, it could be improved. Also, we can use co-citation methods to analyze the intellectual structure of the field. However, space limitations require us to leave this task as a future research line for this work. More specific and detailed analyses are, also, future research possibilities.

DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/**Supplementary Material**.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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SUPPLEMENTARY MATERIAL

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The file can be open with Bibexcel.

- Altinay, L., and Taheri, B. (2019). Emerging themes and theories in the sharing economy: a critical note for hospitality and tourism. *Int. J. Contemp. Hosp. Manag.* 31, 180–193. doi: 10.1108/IJCHM-02-2018-0171
- Alves, H., Fernandes, C., and Raposo, M. (2016). Value co-creation: concept and contexts of application and study. *J. Bus. Res.* 69, 1626–1633. doi: 10.1016/j.jbusres.2015.10.029
- Amann, J., Zanini, C., and Rubinelli, S. (2016). What online user innovation communities can teach us about capturing the experiences of patients living with chronic health conditions. A scoping review. *PLoS One* 11:e0156175. doi: 10.1371/journal.pone.0156175
- Anning-Dorson, T. (2018). Customer involvement capability and service firm performance: the mediating role of innovation. *J. Bus. Res.* 86, 269–280. doi: 10.1016/j.jbusres.2017.07.015

- Baron, S., Warnaby, G., and Hunter-Jones, P. (2014). Service(s) marketing research: developments and directions. *Int. J. Manag. Rev.* 16, 150–171. doi: 10.1111/ijmr.12014
- Beirao, G., Patricio, L., and Fisk, R. P. (2017). Value cocreation in service ecosystems: investigating health care at the micro, meso, and macro levels. *J. Serv. Manag.* 28, 227–249. doi: 10.1108/JOSM-11-2015-0357
- Belarmino, A., and Koh, Y. (2020). A critical review of research regarding peer-to-peer accommodations. *Int. J. Hosp. Manag.* 84:102315. doi: 10.1016/j.ijhm.2019.05.011
- Bharti, K., Agrawal, R., and Sharma, V. (2015). Value co-creation. Literature review and proposed conceptual framework. *Int. J. Mark. Res.* 57, 571–604. doi: 10.2501/IJMR-2015-000
- Blinda, K., Schnitka, O., Sattler, H., and Graeve, J.-F. (2019). Implementing effective customer participation for hedonic and utilitarian services. *J. Serv. Mark.* 33, 316–330. doi: 10.1108/JSM-07-2018-0196
- Boyack, K. W., and Klavans, R. (2010). Co-citation analysis, bibliographic coupling, and direct citation: which citation approach represents the research front most accurately? *J. Am. Soc. Inf. Sci. Technol.* 61, 2389–2404. doi: 10.1002/asi.21419
- Campos, A. C., Mendes, J., do Valle, P. O., and Scott, N. (2015). Co-creation of tourist experiences: a literature review. *Curr. Issues Tour.* 21, 369–400. doi: 10.1080/13683500.2015.1081158
- Chathoth, P. K., Ungson, G. R., Harrington, R. J., and Chan, E. S. W. (2016). Co-creation and higher order customer engagement in hospitality and tourism services: a critical review. *Int. J. Contemp. Hosp. Manag.* 28, 222–245. doi: 10.1108/IJCHM-10-2014-0526
- Chen, C.-L. (2017). Service providers' sustainable service innovation: service-dominant logic. *Serv. Ind. J.* 37, 628–656. doi: 10.1080/02642069.2017.1340456
- Chen, T., Yang, S. O., and Leo, C. (2017). The beginning of value co-creation: understanding dynamics, efforts and betterment. *J. Serv. Theory Pract.* 27, 1145–1166. doi: 10.1108/JSTP-12-2015-0257
- Cheng, C. C. J., and Huizingh, E. K. R. E. (2014). When is open innovation beneficial? The role of strategic orientation. *J. Prod. Innov. Manag.* 31, 1235–1253. doi: 10.1111/jpim.12148
- Chew, E. K. (2016). iSIM: an integrated design method for commercializing service innovation. *Inf. Syst. Front.* 18, 457–478. doi: 10.1007/s10796-015-9605-y
- Cui, A. S., and Wu, F. (2017). The impact of customer involvement on new product development: contingent and substitutive effects. *J. Prod. Innov. Manag.* 34, 60–80. doi: 10.1111/jpim.12326
- Dann, D., Teubner, T., and Weinhardt, C. (2019). Poster child and guinea pig—insights from a structured literature review on Airbnb. *Int. J. Contemp. Hosp. Manag.* 31, 427–473. doi: 10.1108/IJCHM-03-2018-0186
- de Oliveira, D. T., and Cortimiglia, M. N. (2017). Value co-creation in web-based multisided platforms: a conceptual framework and implications for business model design. *Bus. Horiz.* 60, 747–758. doi: 10.1016/j.bushor.2017.07.002
- Di Pietro, L., Edvardsson, B., Reynoso, J., Renzi, M. F., Toni, M., et al. (2018). A scaling up framework for innovative service ecosystems: lessons from Eataly and KidZania. *J. Serv. Manag.* 29, 146–175. doi: 10.1108/JOSM-02-2017-0054
- Dong, B., and Sivakumar, K. (2017). Customer participation in services: domain, scope, and boundaries. *J. Acad. Mark. Sci.* 45, 944–965. doi: 10.1007/s11747-017-0524-y
- Durugbo, C., and Pawar, K. (2014). A unified model of the co-creation process. *Expert Syst. Appl.* 41, 4373–4387. doi: 10.1016/j.eswa.2014.01.007
- Faullant, R., and Dolfus, G. (2017). Everything community? Destructive processes in communities of crowdsourcing competitions. *Bus. Process Manag. J.* 23, 1108–1128. doi: 10.1108/BPMJ-10-2016-0206
- Foglieni, F., and Holmlid, S. (2017). Determining service value: exploring the link between value creation and service evaluation. *Serv. Sci.* 9, 74–90. doi: 10.1287/serv.2016.0164
- Franke, N., Keinz, P., and Klausberger, K. (2013). “Does this sound like a fair deal?”: antecedents and consequences of fairness expectations in the individual's decision to participate in firm innovation. *Organ. Sci.* 24, 1495–1516. doi: 10.1287/orsc.1120.0794
- Füller, J., and Bilgram, V. (2017). The moderating effect of personal features on the consequences of an enjoyable co-creation experience. *J. Prod. Brand Manag.* 26, 386–401. doi: 10.1108/JPBM-03-2016-1122
- Füller, J., Hutter, K., and Faullant, R. (2011). Why co-creation experience matters? Creative experience and its impact on the quantity and quality of creative contributions. *R D Manag.* 41, 259–273. doi: 10.1111/j.1467-9310.2011.00640.x
- Galvagno, M., and Dalli, D. (2014). Theory of value co-creation: a systematic literature review. *Manag. Serv. Qual.* 24, 643–683. doi: 10.1108/MSQ-09-2013-0187
- García Martínez, M. (2014). Co-creation of value by open innovation: unlocking new sources of competitive advantage. *Agribusiness* 30, 132–147. doi: 10.1002/agr.21347
- García Martínez, M. (2015). Solver engagement in knowledge sharing in crowdsourcing communities: exploring the link to creativity. *Res. Policy* 44, 1419–1430. doi: 10.1016/j.respol.2015.05.010
- García Martínez, M., and Walton, B. (2014). The wisdom of crowds: the potential of online communities as a tool for data analysis. *Technovation* 34, 203–214. doi: 10.1016/j.technovation.2014.01.011
- Gebauer, H., Johnson, M., and Enquist, B. (2010). Value co-creation as a determinant of success in public transport services. *Manag. Serv. Qual. An Int. J.* 20, 511–530. doi: 10.1108/09604521011092866
- Ghezzi, A., Gabelloni, D., Martini, A., and Natalicchio, A. (2018). Crowdsourcing: a review and suggestions for future research. *Int. J. Manag. Rev.* 20, 343–363. doi: 10.1111/ijmr.12135
- Grace, A., Gleasure, R., Finnegan, P., and Butler, T. (2019). Enabling service co-production: a theory-building case study. *Eur. J. Inf. Syst.* 28, 413–438. doi: 10.1080/0960085X.2019.1581440
- Greenhalgh, T., Jackson, C., Shaw, S., and Janamian, T. (2016). Achieving research impact through co-creation in community-based health services: literature review and case study. *Milbank Q.* 94, 392–429. doi: 10.1111/1468-0009.12197
- Greer, C. R., and Lei, D. (2012). Collaborative innovation with customers: a review of the literature and suggestions for future research. *Int. J. Manag. Rev.* 14, 63–84. doi: 10.1111/j.1468-2370.2011.00310.x
- Grissemann, U. S., and Stokburger-Sauer, N. E. (2012). Customer co-creation of travel services: the role of company support and customer satisfaction with the co-creation performance. *Tour. Manag.* 33, 1483–1492. doi: 10.1016/j.tourman.2012.02.002
- Guttentag, D. (2019). Progress on Airbnb: a literature review. *J. Hosp. Tour. Technol.* 10, 233–263. doi: 10.1108/JHTT-08-2018-0075
- Hamidi, F., Gharneh, N. S., and Khajeheian, D. (2020). A conceptual framework for value co-creation in service enterprises (case of tourism agencies). *Sustainability* 12:213. doi: 10.3390/su12010213
- Haumann, T., Guentuerken, P., Schons, L. M., and Wieseke, J. (2015). Engaging customers in coproduction processes: how value-enhancing and intensity-reducing communication strategies mitigate the negative effects of coproduction intensity. *J. Mark.* 79, 17–33. doi: 10.1509/jm.14.0357
- Heidenreich, S., and Handrich, M. (2015). Adoption of technology-based services: the role of customers' willingness to co-create. *J. Serv. Manag.* 26, 44–71. doi: 10.1108/JOSM-03-2014-0079
- Heidenreich, S., Wittkowski, K., Handrich, M., and Falk, T. (2015). The dark side of customer co-creation: exploring the consequences of failed co-created services. *J. Acad. Mark. Sci.* 43, 279–296. doi: 10.1007/s11747-014-0387-4
- Helkkula, A., Kowalkowski, C., and Tronvoll, B. (2018). Archetypes of service innovation: implications for value cocreation. *J. Serv. Res.* 21, 284–301. doi: 10.1177/1094670517746776
- Hiennerth, C., Keinz, P., and Lettl, C. (2011). Exploring the nature and implementation process of user-centric business models. *Long Range Plann.* 44, 344–374. doi: 10.1016/j.lrp.2011.09.009
- Hossain, M. (2020). Sharing economy: a comprehensive literature review. *Int. J. Hosp. Manag.* 87:102470. doi: 10.1016/j.ijhm.2020.102470
- Hoyer, W. D., Chandy, R., Dorotic, M., Krafft, M., and Singh, S. S. (2010). Consumer cocreation in new product development. *J. Serv. Res.* 13, 283–296. doi: 10.1177/1094670510375604
- Hsieh, S. H., and Chang, A. (2016). The psychological mechanism of brand co-creation engagement. *J. Interact. Mark.* 33, 13–26. doi: 10.1016/j.intmar.2015.10.001
- Huikkola, T., and Kohtamäki, M. (2017). Solution providers' strategic capabilities. *J. Bus. Ind. Mark.* 32, 752–770. doi: 10.1108/JBIM-11-2015-0213

- Jaakkola, E., Helkkula, A., and Aarikka-Stenroos, L. (2015). Service experience co-creation: conceptualization, implications, and future research directions. *J. Serv. Manag.* 26, 182–205. doi: 10.1108/JOSM-12-2014-0323
- Joly, M. P., Teixeira, J. G., Patricio, L., and Sangiorgi, D. (2019). Leveraging service design as a multidisciplinary approach to service innovation. *J. Serv. Manag.* 30, 681–715. doi: 10.1108/JOSM-07-2017-0178
- Jonas, J. M., and Roth, A. (2017). Stakeholder integration in service innovation—an exploratory case study in the healthcare industry. *Int. J. Technol. Manag.* 73, 91–113. doi: 10.1504/IJTM.2017.082358
- Jonas, J. M., Roth, A., and Moeslein, K. M. (2016). Stakeholder integration for service innovation in German medium-sized enterprises. *Serv. Sci.* 8, 320–332. doi: 10.1287/serv.2016.0152
- Jouny-Rivier, E., Reynoso, J., and Edvardsson, B. (2017). Determinants of services co-creation with business customers. *J. Serv. Mark.* 31, 85–103. doi: 10.1108/JSM-01-2016-0001
- Kamboj, S., and Gupta, S. (2020). Use of smart phone apps in co-creative hotel service innovation: an evidence from India. *Curr. Issues Tour.* 23, 323–344. doi: 10.1080/13683500.2018.1513459
- Karlsson, J., and Skalen, P. (2015). Exploring front-line employee contributions to service innovation. *Eur. J. Mark.* 49, 1346–1365. doi: 10.1108/EJM-10-2012-0568
- Kautish, P., and Sharma, R. (2019). Managing online product assortment and order fulfillment for superior e-tailing service experience: an empirical investigation. *Asia Pacific J. Mark. Logist.* 31, 1161–1192. doi: 10.1108/APJML-05-2018-0167
- Kessler, M. M. (1963). Bibliographic coupling between scientific papers. *Am. Doc.* 14, 10–25. doi: 10.1002/asi.5090140103
- Kohler, T., Füller, J., Stieger, D., and Matzler, K. (2011). Avatar-based innovation: consequences of the virtual co-creation experience. *Comput. Human Behav.* 27, 160–168. doi: 10.1016/j.chb.2010.07.019
- Koskela-Huotari, K., Edvardsson, B., Jonas, J. M., Sorhammar, D., and Witell, L. (2016). Innovation in service ecosystems—Breaking, making, and maintaining institutionalized rules of resource integration. *J. Bus. Res.* 69, 2964–2971. doi: 10.1016/j.jbusres.2016.02.029
- Kovács, A., Van Looy, B., and Cassiman, B. (2015). Exploring the scope of open innovation: a bibliometric review of a decade of research. *Scientometrics* 104, 951–983. doi: 10.1007/s11192-015-1628-0
- Leclercq, T., Hammedi, W., and Poncin, I. (2016). Ten years of value cocreation: an integrative review. *Rech. Appl. Mark.* 31, 26–60. doi: 10.1177/2051570716650172
- Li, A. Q., Kumar, M., Claes, B., and Found, P. (2020). The state-of-the-art of the theory on product-service systems. *Int. J. Prod. Econ.* 222:107491. doi: 10.1016/j.jipe.2019.09.012
- Loss, L., and Crave, S. (2011). Agile business models: an approach to support collaborative networks. *Prod. Plan. Control* 22, 571–580. doi: 10.1080/09537287.2010.536646
- Lusch, R. F., and Nambisan, S. (2015). Service innovation: a service-dominant logic perspective. *Mis Q.* 39, 155–175. doi: 10.25300/MISQ/2015/39.1.07
- Lusch, R. F., Vargo, S. L., and Gustafsson, A. (2016). Fostering a trans-disciplinary perspectives of service ecosystems. *J. Bus. Res.* 69, 2957–2963. doi: 10.1016/j.jbusres.2016.02.028
- Mahr, D., and Lievens, A. (2012). Virtual lead user communities: drivers of knowledge creation for innovation. *Res. Policy* 41, 167–177. doi: 10.1016/j.respol.2011.08.006
- Mahr, D., Lievens, A., and Blazeovic, V. (2014). The value of customer cocreated knowledge during the innovation process. *J. Prod. Innov. Manag.* 31, 599–615. doi: 10.1111/jpim.12116
- Martínez-Cañas, R., Ruiz-Palomino, P., Linuesa-Langreo, J., and Blázquez-Resino, J. J. (2016). Consumer participation in co-creation: an enlightening model of causes and effects based on ethical values and transcendent motives. *Front. Psychol.* 7:793. doi: 10.3389/fpsyg.2016.00793
- Mele, C., Colurcio, M., and Russo-Spena, T. (2014). Research traditions of innovation: goods-dominant logic, the resource-based approach, and service-dominant logic. *Manag. Serv. Qual.* 24, 612–642. doi: 10.1108/MSQ-10-2013-0223
- Mendes, G. H. S., Oliveira, M. G., Gomide, E. H., and Nantes, J. F. D. (2017). Uncovering the structures and maturity of the new service development research field through a bibliometric study (1984–2014). *J. Serv. Manag.* 28, 182–223. doi: 10.1108/JOSM-07-2015-0230
- Meyer, M., Grant, K., Morlacchi, P., and Weckowska, D. (2014). Triple Helix indicators as an emergent area of enquiry: a bibliometric perspective. *Scientometrics* 99, 151–174. doi: 10.1007/s11192-013-1103-8
- Mingione, M., and Leoni, L. (2020). Blurring B2C and B2B boundaries: corporate brand value co-creation in B2B2C markets. *J. Mark. Manag.* 36, 72–99. doi: 10.1080/0267257X.2019.1694566
- Morgan, T., Anokhin, S. A., and Wincet, J. (2019). Influence of market orientation on performance: the moderating roles of customer participation breadth and depth in new product development. *Ind. Innov.* 26, 1103–1120. doi: 10.1080/13662716.2019.1566053
- Morgan, T., Obal, M., and Anokhin, S. (2018). Customer participation and new product performance: towards the understanding of the mechanisms and key contingencies. *Res. Policy* 47, 498–510. doi: 10.1016/j.respol.2018.01.005
- Morosan, C. (2018). An empirical analysis of intentions to cocreate value in hotels using mobile devices. *J. Hosp. Tour. Res.* 42, 528–562. doi: 10.1177/1096348015597034
- Morosan, C., and DeFranco, A. (2016). Co-creating value in hotels using mobile devices: a conceptual model with empirical validation. *Int. J. Hosp. Manag.* 52, 131–142. doi: 10.1016/j.ijhm.2015.10.004
- Mura, M., Longo, M., Micheli, P., and Bolzani, D. (2018). The evolution of sustainability measurement research. *Int. J. Manag. Rev.* 20, 661–695. doi: 10.1111/ijmr.12179
- Ngo, L. V., and O’Cass, A. (2013). Innovation and business success: the mediating role of customer participation. *J. Bus. Res.* 66, 1134–1142. doi: 10.1016/j.jbusres.2012.03.009
- Nicola, C., Gabriella, P., and Carmela, A. (2019). Value co-creation and co-production in the interaction between citizens and public administration: a systematic literature review. *Kybernetes* 49, 313–331. doi: 10.1108/K-07-2018-0383
- O’Cass, A., and Ngo, L. V. (2012). Creating superior customer value for B2B firms through supplier firm capabilities. *Ind. Mark. Manag.* 41, 125–135. doi: 10.1016/j.indmarman.2011.11.018
- Oertzen, A.-S., Odekerken-Schroder, G., Brax, S. A., and Mager, B. (2018). Co-creating services—conceptual clarification, forms and outcomes. *J. Serv. Manag.* 29, 641–679. doi: 10.1108/JOSM-03-2017-0067
- Palo, T., Akeson, M., and Lofberg, N. (2019). Servitization as business model contestation: a practice approach. *J. Bus. Res.* 104, 486–496. doi: 10.1016/j.jbusres.2018.10.037
- Parida, V., and Wincet, J. (2019). Why and how to compete through sustainability: a review and outline of trends influencing firm and network-level transformation. *Int. Entrep. Manag. J.* 15, 1–19. doi: 10.1007/s11365-019-00558-9
- Parmentier, G. (2015). How to innovate with a brand community. *J. Eng. Technol. Manag.* 37, 78–89. doi: 10.1016/j.jengtecman.2015.08.001
- Patricio, L., de Pinho, N. F., Teixeira, J. G., and Fisk, R. P. (2018). Service design for value networks: enabling value cocreation interactions in healthcare. *Serv. Sci.* 10, 76–97. doi: 10.1287/serv.2017.0201
- Paulin, M., and Ferguson, R. J. (2010). Relational norms in interfirm exchanges: from transactional cost economics to the service-dominant logic. *J. Bus. Mark.* 17, 365–405. doi: 10.1080/10517120903574615
- Persson, O., Danell, R., and Schneider, J. W. (2009). “How to use Bibexcel for various types of bibliometric analysis,” in *Celebrating Scholarly Communication Studies: A Festschrift for Olle Persson at his 60th Birthday*, Vol. 5, eds F. Åström, R. Danell, B. Larsen, J. Schneider (Leuven: International Society for Scientometrics and Informetrics), 9–24.
- Polese, F., Botti, A., Grimaldi, M., Monda, A., and Vesci, M. (2018). Social innovation in smart tourism ecosystems: how technology and institutions shape sustainable value co-creation. *Sustainability* 10:140. doi: 10.3390/su10010140
- Prahalad, C. K., and Ramaswamy, V. (2000). Co-opting customer competence. *Harv. Bus. Rev.* 78, 79–90.
- Prahalad, C. K., and Ramaswamy, V. (2004). Co-creating unique value with customers. *Strateg. Leadersh.* 32, 4–9. doi: 10.1108/10878570410699249
- Priharsari, D., Abedin, B., and Mastio, E. (2020). Value co-creation in firm sponsored online communities: what enables, constrains, and

- shapes value. *Internet Res.* 30, 763–788. doi: 10.1108/INTR-05-2019-0205
- Raddats, C., Kowalkowski, C., Benedettini, O., Burton, J., and Gebauer, H. (2019). Servitization: a contemporary thematic review of four major research streams. *Ind. Mark. Manag.* 83, 207–223. doi: 10.1016/j.indmarman.2019.03.015
- Ralf, W., and Siegfried, G. (2017). Service-dominant orientation, dynamic capabilities and firm performance. *J. Serv. Theory Pract.* 27, 808–832. doi: 10.1108/JSTP-04-2016-0077
- Ramaswamy, V., and Gouillart, F. J. (2010). *The Power of Co-creation: Build it with them to Boost Growth, Productivity, and Profits*. New York, NY: Simon and Schuster.
- Ramaswamy, V., and Ozcan, K. (2016). Brand value co-creation in a digitalized world: an integrative framework and research implications. *Int. J. Res. Mark.* 33, 93–106. doi: 10.1016/j.ijresmar.2015.07.001
- Ramaswamy, V., and Ozcan, K. (2018). What is co-creation? An interactional creation framework and its implications for value creation. *J. Bus. Res.* 84, 196–205. doi: 10.1016/j.jbusres.2017.11.027
- Ramírez-Montoya, M.-S., and García-Peñalvo, F.-J. (2018). Co-creation and open innovation: systematic literature review. *Comunicar* 26, 9–18. doi: 10.3916/C54-2018-01
- Randhawa, K., Wilden, R., and Gudergan, S. (2018). Open service innovation: the role of intermediary capabilities. *J. Prod. Innov. Manag.* 35, 808–838. doi: 10.1111/jpim.12460
- Randhawa, K., Wilden, R., and Hohberger, J. (2016). A bibliometric review of open innovation: setting a research agenda. *J. Prod. Innov. Manag.* 33, 750–772. doi: 10.1111/jpim.12312
- Ribeiro, H., Tavares, V., and Costa, B. (2016). Cocriação de valor: uma bibliometria de 2000 a 2014. *Rev. Eletrônica Estratégia Negócios* 9, 118–152. doi: 10.19177/reen.v9e12016118-151
- Ruiz-Alba, J. L., Soares, A., Rodriguez-Molina, M. A., and Frias-Jamilena, D. M. (2019). Servitization strategies from customers' perspective: the moderating role of co-creation. *J. Bus. Ind. Mark.* 34, 628–642. doi: 10.1108/JBIM-02-2017-0028
- Russo-Spena, T., and Mele, C. (2012). “Five Co-s” in innovating: a practice-based view. *J. Serv. Manag.* 23, 527–553. doi: 10.1108/09564231211260404
- Ryzhkova, N. (2015). Does online collaboration with customers drive innovation performance? *J. Serv. Theory Pract.* 25, 327–347. doi: 10.1108/JSTP-02-2014-0028
- Saha, V., Mani, V., and Goyal, P. (2020). Emerging trends in the literature of value co-creation: a bibliometric analysis. *Benchmark. Int. J.* 27, 981–1002. doi: 10.1108/BIJ-07-2019-0342
- Santos-Vijande, M. L., Gonzalez-Mieres, C., and Lopez-Sanchez, J. A. (2013). An assessment of innovativeness in KIBS: implications on KIBS' co-creation culture, innovation capability, and performance. *J. Bus. Ind. Mark.* 28, 86–101. doi: 10.1108/08858621311295236
- Santos-Vijande, M. L., Lopez-Sanchez, J. A., and Pascual-Fernandez, P. (2018). Co-creation with clients of hotel services: the moderating role of top management support. *Curr. Issues Tour.* 21, 301–327. doi: 10.1080/13683500.2015.1078781
- Santos-Vijande, M. L., Lopez-Sanchez, J. A., and Rudd, J. (2016). Frontline employees' collaboration in industrial service innovation: routes of co-creation's effects on new service performance. *J. Acad. Mark. Sci.* 44, 350–375. doi: 10.1007/s11747-015-0447-4
- Sarmah, B., Kamboj, S., and Rahman, Z. (2017). Co-creation in hotel service innovation using smart phone apps: an empirical study. *Int. J. Contemp. Hosp. Manag.* 29, 2647–2667. doi: 10.1108/IJCHM-12-2015-0681
- Schmidt, H. J., and Redler, J. (2018). How diverse is corporate brand management research? Comparing schools of corporate brand management with approaches to corporate strategy. *J. Prod. Brand Manag.* 27, 185–202. doi: 10.1108/JPBM-05-2017-1473
- Siltaloppi, J., Koskela-Huotari, K., and Vargo, S. L. (2016). Institutional complexity as a driver for innovation in service ecosystems. *Serv. Sci.* 8, 333–343. doi: 10.1287/serv.2016.0151
- Skalen, P., Gummerus, J., von Koskull, C., and Magnusson, P. R. (2015). Exploring value propositions and service innovation: a service-dominant logic study. *J. Acad. Mark. Sci.* 43, 137–158. doi: 10.1007/s11747-013-0365-2
- Skute, I., Zalewska-Kurek, K., Hatak, I., and de Weerd-Nederhof, P. (2019). Mapping the field: a bibliometric analysis of the literature on university–industry collaborations. *J. Technol. Transf.* 44, 916–947. doi: 10.1007/s10961-017-9637-1
- Stokburger-Sauer, N. E., Scholl-Grissemann, U., Teichmann, K., and Wetzels, M. (2016). Value cocreation at its peak: the asymmetric relationship between coproduction and loyalty. *J. Serv. Manag.* 27, 563–590. doi: 10.1108/JOSM-10-2015-0305
- Story, V. M., Raddats, C., Burton, J., Zolkiewski, J., and Baines, T. (2017). Capabilities for advanced services: a multi-actor perspective. *Ind. Mark. Manag.* 60, 54–68. doi: 10.1016/j.indmarman.2016.04.015
- Tang, L., Kim, J., and Wang, X. (2019). Estimating spatial effects on peer-to-peer accommodation prices: towards an innovative hedonic model approach. *Int. J. Hosp. Manag.* 81, 43–53. doi: 10.1016/j.ijhm.2019.03.012
- Teixeira, A. A. C., and Mota, L. (2012). A bibliometric portrait of the evolution, scientific roots and influence of the literature on university–industry links. *Scientometrics* 93, 719–743. doi: 10.1007/s11192-012-0823-5
- Tekic, A., and Willoughby, K. (2019). Co-creation – child, sibling or adopted cousin of open innovation? *Innovation* 21, 274–297. doi: 10.1080/14479338.2018.1530565
- Testa, S., Massa, S., Martini, A., and Appio, F. P. (2020). Social media-based innovation: a review of trends and a research agenda. *Inf. Manag.* 57:103196. doi: 10.1016/j.im.2019.103196
- Tjandra, N. C., Ensor, J., and Thomson, J. R. (2019). Co-creating with intermediaries: understanding their power and interest. *J. Bus. Bus. Mark.* 26, 319–339. doi: 10.1080/1051712X.2019.1611086
- Tormala, M., and Saraniemi, S. (2018). The roles of business partners in corporate brand image co-creation. *J. Prod. Brand Manag.* 27, 29–40. doi: 10.1108/JPBM-01-2016-1089
- Tregua, M., D'Auria, A., and Costin, H. (2020). #10yearschallenge: how co-creation permeated tourism research. A bibliometric analysis. *Eur. J. Tour. Res.* 24:2409. Available online at: <https://ejtr.vumk.eu/index.php/about/article/view/411>
- van Eck, N. J., and Waltman, L. (2009). How to normalize cooccurrence data? An analysis of some well-known similarity measures. *J. Am. Soc. Inf. Sci. Technol.* 60, 1635–1651. doi: 10.1002/asi.21075
- van Eck, N. J., and Waltman, L. (2014). “Visualizing bibliometric networks,” in *Measuring Scholarly Impact: Methods and Practice*, eds Y. Ding, R. Rousseau, and D. Wolfram (Cham: Springer International Publishing), 285–320. doi: 10.1007/978-3-319-10377-8_13
- van Oorschot, J. A. W. H., Hofman, E., and Halman, J. I. M. (2018). A bibliometric review of the innovation adoption literature. *Technol. Forecast. Soc. Change* 134, 1–21. doi: 10.1016/j.techfore.2018.04.032
- Vargo, S. L., and Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *J. Acad. Mark. Sci.* 44, 5–23. doi: 10.1007/s11747-015-0456-3
- Vargo, S. L., and Lusch, R. F. (2017). Service-dominant logic 2025. *Int. J. Res. Mark.* 34, 46–67. doi: 10.1016/j.ijresmar.2016.11.001
- Vogel, R., and Güttel, W. H. (2013). The dynamic capability view in strategic management: a bibliometric review. *Int. J. Manag. Rev.* 15, 426–446. doi: 10.1111/ijmr.12000
- Voorberg, W. H., Bekkers, V. J. J. M., and Tummers, L. G. (2015). A systematic review of co-creation and co-production: embarking on the social innovation journey. *Public Manag. Rev.* 17, 1333–1357. doi: 10.1080/14719037.2014.930505
- Wallin, A. J., and Fuglsang, L. (2017). Service innovations breaking institutionalized rules of health care. *J. Serv. Manag.* 28, 972–997. doi: 10.1108/JOSM-04-2017-0090
- Waltman, L., van Eck, N. J., and Noyons, E. C. M. (2010). A unified approach to mapping and clustering of bibliometric networks. *J. Informetr.* 4, 629–635.
- West, J., and Bogers, M. (2014). Leveraging external sources of innovation: a review of research on open innovation. *J. Prod. Innov. Manag.* 31, 814–831. doi: 10.1111/jpim.12125
- Wilden, R., Akaka, M. A., Karpen, I. O., and Hohberger, J. (2017). The evolution and prospects of service-dominant logic: an investigation of past, present, and future research. *J. Serv. Res.* 20, 345–361. doi: 10.1177/1094670517715121

- Windahl, C. (2015). Understanding solutions as technology-driven business innovations. *J. Bus. Ind. Mark.* 30, 378–393. doi: 10.1108/JBIM-11-2013-0253
- Windler, K., Juttner, U., Michel, S., Maklan, S., and Macdonald, E. K. (2017). Identifying the right solution customers: a managerial methodology. *Ind. Mark. Manag.* 60, 173–186. doi: 10.1016/j.indmarman.2016.03.004
- Yu, E., and Sangiorgi, D. (2018). Service design as an approach to implement the value cocreation perspective in new service development. *J. Serv. Res.* 21, 40–58. doi: 10.1177/1094670517709356
- Zhang, J., Jiang, Y., Shabbir, R., and Du, M. (2015). Building industrial brand equity by leveraging firm capabilities and co-creating value with customers. *Ind. Mark. Manag.* 51, 47–58. doi: 10.1016/j.indmarman.2015.05.016
- Zhang, T., Bufquin, D., and Lu, C. (2019). A qualitative investigation of microentrepreneurship in the sharing economy. *Int. J. Hosp. Manag.* 79, 148–157. doi: 10.1016/j.ijhm.2019.01.010
- Zupic, I., and Čater, T. (2015). Bibliometric methods in management and organization. *Organ. Res. Methods* 18, 429–472. doi: 10.1177/1094428114562629
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Customer Experience and Satisfaction in Private Insurance Web Areas

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Digital transformation has allowed to offer additional services—which complement the main product—both in terms of use, emotional, and relationship terms. Focusing on a traditionally rational insurance customer offering a value that explores the customer's emotions, from co-creating with the user, allows brand differentiation. Given this idea, this document has three purposes. First is identify the true role of expectations and the perceived quality of the customer's digital experience. Second is to identify the relationship between customer experience and satisfaction gained in private insurance web areas. Third is to identify the most valued digital attributes by the user. A sample of 4,178 customers registered was analyzed using the partial least-squares technique. The model is highly predictive to customer experience and evidence the important relationship between the WOW effect and satisfaction, as well as the weak but double role that expectations play on insurance digital self-service. The model demonstrates that expectations are only relevant before web consumption, because during the process it is the perceived digital quality, in particular the usefulness, information, and technology, that offers a true customer experience. This article offers high academic value because it more accurately defines the determinants of the digital insurance customer experience and its effect on customer satisfaction in digital services. While expectations influence attitude before service, this research reveals that perceived digital quality is what delivers a true customer experience. Strategically, the implications are immediate in the field of business as it shows the importance of co-creation in digital design, not only because of the significant savings in implementation costs but also because it guarantees a greater experience, essential in the loyalty of its customers. This ensures the sustainable growth of the company.

Keywords: customer digital experience, customer satisfaction, quality web, customer expectations, private customer web areas, effect WOW, insurance field, co-creation

HIGHLIGHTS

- The customer experience is predictable from customer expectations and the quality offered in insurance digital service.
- The expectations are relevant before web consumption, but during the process it is the perceived digital quality that offers a true insurance customer digital experience.
- Customer expectations influence on the perceived satisfaction indirectly, through the mediation of the insurance customer digital experience.
- The customer experience of the result of the insurance digital service impacts directly on their satisfaction with that result.
- In a digital self-service, information is the most valued attribute, which makes an agent unnecessary.
- In a virtual environment, the quality of the platform is highly valued, specifically the multi-device adaptation, speed, and ease of use.

INTRODUCTION

Since the beginning of the 21st century, there have been multiple economic analysts who point to the relevance of services as the ability to add value to a brand (Vargo and Lusch, 2008). This feature allows companies to develop a differential competitive strategy (Ali et al., 2018), based on an innovative service offering (VI DEC Congress, 2019) offered in a unique (Blut et al., 2014) and customized way (Bilgihan et al., 2015). This new customer centricity vision (Kohli et al., 2019) implies a great knowledge of their behavior and needs (De Mooij, 2019), including affective ones (The Human Brand Report, Grass Roots, 2018). In this new interconnected socioeconomic context, it reveals that the role of consumers has changed substantially and consumer participation has become key to the development of products and services of mutual value as a source of innovative ideas and brand value (Martínez-Cañas et al., 2016). Research reveals that personalization, excellence in supply and service, and speed of delivery are critical in consumers' value perception (Deloitte, 2017). In this way, digital channels offer companies a great opportunity to create functional value to consumers but also emotional value that as a differential tool (Zhu and Gao, 2019) can consolidate company-consumer relationship (Karjaluo et al., 2012) since they allow the implementation of a space in which the relationship is different, even extraordinary (Carù and Cova, 2013), based on the generation of experiences and co-creation of solutions (García Haro, 2018).

Although digital reality is a fact (PWC, 2017), it is not easy to implement value self-services in all sectors and consolidate the adoption and dissemination of the web channel among customers (Nicoletti, 2016). In the case of insurance, the provision of services concerns the possibility of risk of human life, and/or the most precious assets of customers made an object of insurance (García, 2010), and where confidence that the company will meet one's needs is the key (Capgemini, 2020). This makes the customer's perception of this product high risk and seeks non-virtual channels (Minsait, Asociación para el Desarrollo de la

Experiencia de Cliente (DEC), 2019) as a means of relationship with insurers. Guaranteeing this trust from a digital service is difficult since the private area must satisfy two profiles of well-differentiated behaviors: (1) the rational profile that prevails when contracting the insurance, where the information (Chang et al., 2014) and transaction security minimize the perceived risk (Currás-Pérez and Sánchez-García, 2012; Thakur and Srivastava, 2014) and (2) the emotional profile experienced when requesting the contracted service: reporting a mishap in the customer's assets including the death of loved ones. In these cases, the moment of the client's truth (IZO, 2019) on the digital channel must behave with sufficient quality and warmth (Grass Roots, 2018) that it would have received from an agent (Palm, 2016).

In short, this additional service provided by the digital channel, added to the main service, increases the value of other intangibles (dominant service logic, Vargo and Lusch, 2014) and therefore allows not only a brand experience through direct and continuous contact, but also provides other high-value elements such as effectiveness, efficiency, support and other useful services (Inbound Marketing, InboundCycle, 2020).

Despite the divergence between sectors, it is important to highlight that what has unanimously changed is the way in which consumers approach the sector and where the service is resolved in real time in a simple way (EIOPA, 2017). In the case of the insurance field, the client cannot compare the digital experience with the immediate competitors, but it will do so with the sectors with which it is digitally related (Amezua, 2019). Moreover, as the author says, social change is parallel to technology "so that adaptation to new technologies is essential to avoid the obsolescence of company services" (Amezua, 2019).

However, despite the social changes and the relevance of the digital customer experience on trust in the insurance brands (Han and Hyun, 2015) and loyalty in the consumer (Ali et al., 2018), in a sector that is 8.92 of the world GDP (OECD, 2020), the authors Pérez-Rave and Muñoz-Giraldo (2014) warn of insufficient research on the quality of service from an attitudinal perspective and studies of models of complex behaviors, where multiple variables interact.

But what is customer experience? The term "customer experience" was introduced by Holbrook and Hirschman (1982), but it was not until 1999 that it first appeared in academic literature (Pine and Gilmore, 1999). The ability to simultaneously meet functional and pleasurable needs (Tamborini et al., 2011), through surprising and memorable encounters (Ali et al., 2014), allows the creation of unique experiences (Blut et al., 2014) of a cognitive, social, affective, and physical nature between the client and the company (Vargo and Lusch, 2014).

The challenge for insurance companies is to turn digital interaction into an added value for the customer and not simply meet their needs in a way that allows them to increase their brand experience (Wanick et al., 2017), increase their reputation (De Quevedo et al., 2005), and enhance channel loyalty (Chen and Phou, 2013). New values are incorporated into the service (cite Anne's book), beyond intrinsic functional value, such as (1) Emotional Value or capacity for well-being, emotion, and happiness in digital interaction (Lemon and Verhoef, 2016); (2) Social Value, where the client improves his position and his own

TABLE 1 | Justification of scales used.

Name of item	Description of item	References
Expectations of the digital channel:		
EXPGL1	Overall expectations	Knutson et al. (1990)
EXPGL2	Expectations of information	Swaia and Wigand (2012), Chang et al. (2014), Michalco et al. (2015)
EXPGL3	Expectations of the process	Swaia and Wigand (2012), Chang et al. (2014), Michalco et al. (2015)
EXPGL4	Expectations of the system	Swaia and Wigand (2012), Chang et al. (2014), Michalco et al. (2015)
Quality of digital information:		
CAIN1	Important information	Yang and Jun (2002), Long and McMellon (2004), Hsu et al. (2012), Swaid and Wigand (2012), Chang et al. (2014)
CAIN2	Clear information	Loiacono et al. (2000), Yang and Jun (2002), Long and McMellon (2004), Hsu et al. (2012), Swaid and Wigand (2012)
CAIN3	Detailed information	Yang and Jun (2002), Hsu et al. (2012), Swaid and Wigand (2012), Chang et al. (2014)
CAIN4	Sufficient information	Madu and Madu (2002), Yang and Jun (2002), Hsu et al. (2012), Swaid and Wigand (2012), Chang et al. (2014)
CAIN5	Updated information	Hsu et al. (2012), Swaid and Wigand (2012), Chang et al. (2014)
CAIN6	Quality information	Liu and Arnett (2000), Waite and Harrison (2002), Yang and Jun (2002), Hsu et al. (2012),
Digital service quality:		
CASE1	Information on data security policy	Madu and Madu (2002), Caruana and Ewing (2006), Kassim and Asiah Abdullah (2010), Swaid and Wigand (2012), Chang et al. (2014), Thakur and Srivastava (2014)
CASE2	No support agent needed	Long and McMellon (2004), Yang et al. (2004), Swaid and Wigand (2012), Chang et al. (2014)
CASE3	Reliability: expected results	Parasuraman et al. (1985), Zeithaml and Bitner (2000), Madu and Madu (2002), Wolfinbarger and Gilly (2002), Yang and Jun (2002), Long and McMellon (2004), Yang et al. (2004), Swaid and Wigand (2012), Chang et al. (2014)
CASE4	Speed of service	Yoo and Donthu (2001), Yang and Jun (2002), Swaid and Wigand (2012), Chang et al. (2014)
CASE6	Excellent service	Liu and Arnett (2000), Madu and Madu (2002)
Perceived quality of digital system:		
CASI1	Data security	Liu and Arnett (2000), Zeithaml and Bitner (2000), Madu and Madu (2002), Caruana and Ewing (2006), Kassim and Asiah Abdullah (2010), Swaid and Wigand (2012)
CASI2	Multidevice adaptation	Zeithaml and Bitner (2000), Bauer et al. (2006), Swaid and Wigand (2012), Klaus (2013), Chang et al. (2014), Bilgihan et al. (2015), Huang et al. (2015)

(Continued)

TABLE 1 | Continued

Name of item	Description of item	References
CASI3	System availability	Swaia and Wigand (2012), Al Sokkar and Law (2013), Chang et al. (2014)
CASI4	Speed of response	Cai and Jun (2003), Long and McMellon (2004), Bauer et al. (2006), Kassim and Asiah Abdullah (2010), Chang et al. (2014)
CASI5	Attractive design	Liu and Arnett (2000), Caruana and Ewing (2006), Bauer et al. (2006), Hartmann et al. (2008), Swaid and Wigand (2012), Al Sokkar and Law (2013), Michalco et al. (2015)
CASI6	Platform quality	Cox and Dale (2001), Waite and Harrison (2002), Zavareh et al. (2012), Al Sokkar and Law (2013), Michalco et al. (2015)
CASI7	Ease of use	Loiacono et al. (2000), Zeithaml and Bitner (2000), Cox and Dale (2001), Yang and Jun (2002), Gefen et al. (2003), Long and McMellon (2004), Yang et al. (2004), Kassim and Asiah Abdullah (2010), Chang et al. (2014)
Digital customer experience:		
SATI1	Customer experience: Accomplishment of proposal	Knutson et al. (1990), Oliver (2014), Suarez Álvarez et al. (2007), San Martín Gutiérrez et al. (2008)
SATI2	Customer experience: Surpassing of expectations	Knutson et al. (1990), Oliver (2014), Carù and Cova (2008), Suarez Álvarez et al. (2007), San Martín Gutiérrez et al. (2008)
Perceived satisfaction with the digital experience:		
SAIN6	Satisfaction with information	Swaia and Wigand (2012), Chang et al. (2014)
SASE6	Satisfaction with service	Madu and Madu (2002), Swaid and Wigand (2012), Chang et al. (2014)
SASI6	Satisfaction with channel	Swaia and Wigand (2012), Chang et al. (2014)
SAUS	Satisfaction with device	Bauer et al. (2006), Klaus (2013), Bilgihan et al. (2015), Huang et al. (2015)
SAIN6B	General satisfaction	Swaia and Wigand (2012), Chang et al. (2014)

identity by adopting technology (Bilgihan et al., 2016); and (3) Epistemic Value: it relates to the sense of adventure and the satisfaction of obtaining a knowledge that takes away his curiosity (related to flow perception, Nakamura and Csikszentmihalyi, 2014). Therefore, it is necessary to know the mechanism through which the digital service allows the simultaneous customer to (1) achieve the functional need that led them to use the service and (2) obtain a personal, unique, and an exclusive experience, in such a way as to produce a high degree of customer satisfaction. In this process, the quality of the web service is key to obtaining the desired result, in accordance with the initial expectations of the client (Michalco et al., 2015) and make evaluations accordingly (Kujala et al., 2017). Although the co-creation process is a common marketing practice (García Haro, 2018), in the virtual field the lack of possibility of customization of private web

TABLE 2 | Survey technical data.

Universe	253,174 active users
Town/city/village	23,223 insured individuals with access to the services the month prior to sampling
Sample	4,178 insured individuals
Degree of trust	95%
Sample error	± 1.5%
Maximum variance supported	P = q = 0.5
Survey date	1-25 June 2016
Survey procedure	Mass mailing with link to questionnaire sent to all registered users

areas is notorious. In this process, it is not only necessary to listen to the needs of the client, but, as García Haro (2018) indicates, also necessary to incorporate the virtual consumer in the decision processes that improve the experience, such as the digital design of the services and what attributes they should possess, so that they respond to the expectations of the users of those private web areas. This requires innovation in knowledge, relationship models, new technologies, and services to provide new experiences (Marketing Science Institute, 2016).

In this socioeconomic and technological context described, in deep current change, this research sets the objective of investigating the antecedents and consequences of the digital customer experience in the insurance sector. It is intended to confirm whether the client's behavior model presents differences compared to the reference framework consulted due to the different bias that differentiates it from other services. On the one hand, the one that provides the adoption of technology in a traditionally non-digital sector (Thakur and Srivastava, 2014; Minsait, Asociación para el Desarrollo de la Experiencia de Cliente (DEC), 2019; Capgemini, 2020). Second is the risk due to the very nature of its coverage (García, 2010). In this new business strategy focused on the customer experience (Comisión nacional de los Mercados y la Competencia [CNMC], 2019), where users expect quality services, congruent with the value of the brand (Rather and Camilleri, 2019), it seems necessary to delve into the sector and relate consumer expectations and quality of service as a background to the experience. Research that has not been identified in the reference literature on the digital attributes is considered. Although it would be necessary to reel how the customer experience is shaped from cognitive, affective, and behavioral dimensions (Rather, 2020), this research raises three objectives specific about the digital customer experience: (a) the objective of verifying whether the user's attitude is relevant to user satisfaction from the perceived experience, that is, identify the true role of expectations and the perceived quality of the customer's digital experience, (b) identify the relationship between customer experience and satisfaction gained in private insurance web areas, and (c) identify the most valued digital attributes by the user. For it, this article proposes an analysis of these private customer web areas, where it is possible to measure and analyze customer behavior through a relational model of customer experience. To do this, it begins by analyzing the relationship between the following

four variables: *expectations, quality, customer experience, and satisfaction.*

The results statistically confirmed the robustness of the model, which allows the customer experience to be considered as predictive based on the proposed determinants and, therefore, to formulate implications/conclusions of great interest to the scientific community in the knowledge of the behavior of the digital consumer. However, the business implications are also noteworthy as they promote in the business community the consolidation of Customer Experience programs and offer immersive digital services, essential for the sustainability of companies given the influence that the customer experience has on satisfaction and this on trust (Han and Hyun, 2015) and loyalty to the company (Yoo et al., 2013) and the adoption of the new communication channels (Chen and Phou, 2013). Knowing the best communication strategy with one's client by new channels can bring considerable savings in companies in their digital transformation (Comisión nacional de los Mercados y la Competencia [CNMC], 2019) in order to optimize million-dollar investments in advertising, technology, and better information systems (SI).

THEORETICAL FRAMEWORK AND HYPOTHESIS

According to the iabSpain (2018), the new customer profile is that of the connected individual. Intensive use of digital channels enables this individual to maintain a continuous, direct, and interactive relationship with the company. This demands a highly personalized product and service offering as well as immediacy and agility in the delivery of value (Deloitte, 2017).

This new type of relationship enables customers to formulate expectations in relation to what they expect to receive from the digital service, on which they will evaluate the results obtained in terms of experience and satisfaction according to the quality presented by the web service.

Knowledge of the Expectations of a Digital Service

Expectations are the subject of continuous research in the marketing environment. Their importance in the consumer decision processes (Guadarrama Tavira and Rosales Estrada, 2015) makes effective expectation management a strategic objective for companies (Noe et al., 2017).

The many definitions offered on this concept demonstrate that expectations are formed in the mind of the individual and are therefore subjective in nature (Pelegrín-Borondo et al., 2016), subject to the individual's hope (Real Academia Española, 2019), belief, or idea (Warren, 2018) that something might happen or take effect in a certain situation (Peralta Montecinos, 2015). Expectations are also the benchmark by which the individual compares (Oliver, 2014) and evaluates (Rodríguez del Bosque and San Martín, 2008) the result obtained. Expectations, therefore, set the threshold for the minimum accepted by the individual.

It should be noted that expectations evolve over time according to changes to the context in which the relationship

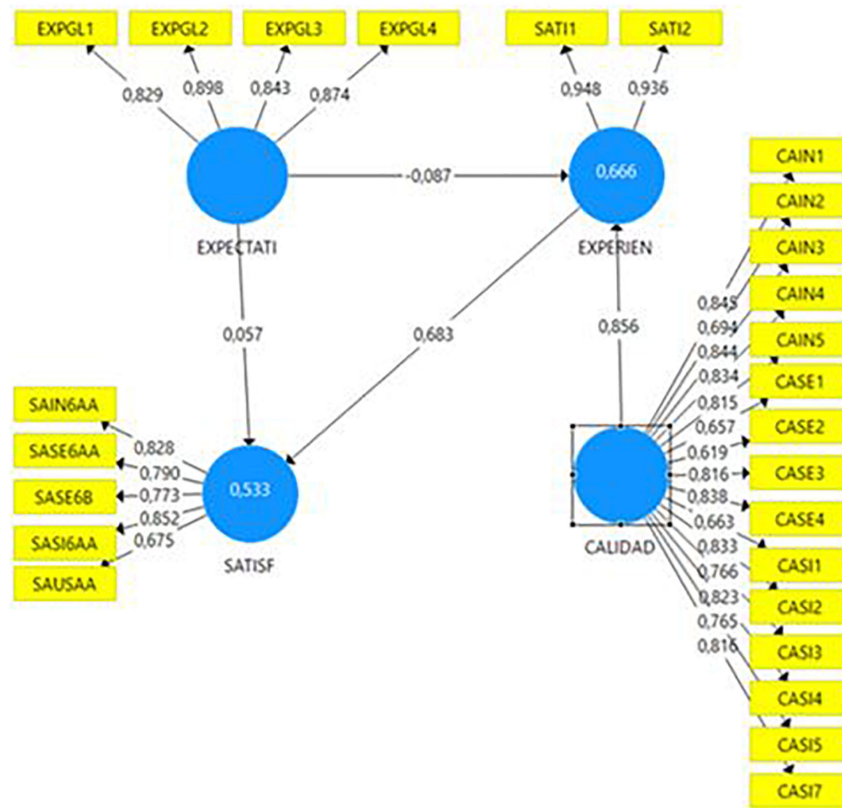


FIGURE 1 | Structural model of Customer Experience.

takes place (Pelegrín-Borondo et al., 2016). As the individual gains experience, however, their expectations become more stable and are transformed into a generalized belief held by the individual in relation to what can be received (Meyer and Harris, 2012).

Due to their psychological nature, expectations clearly play an important part in the development of an individual's emotional attachment to a brand (Pelegrín-Borondo et al., 2017). The analysis and management of expectations therefore offers companies a strategic opportunity during the consumer's decision-making process (Gómez Borja, 2014), thanks to the creation of channels through which companies can relate to their customers in a technological context (De Keyser and Larivière, 2014; Wang et al., 2016). Specifically, in relation to a digital service such as private customer web areas, the individual establishes expectations in terms of (1) the service's ability to respond to a need (competence or capacity to resolve a problem) and (2) the way in which this response is offered (digital procedure or interaction). Also, the technological component that sustains this process is as fundamental to what the individual expects as to what they receive (Swaid and Wigand, 2012; Chang et al., 2014; De Keyser and Larivière, 2014; Wang et al., 2016).

Numerous studies recognize the role of expectations in the experience and satisfaction the customer receives (Cheung

et al., 2015; Huang et al., 2015; Ali et al., 2016). The fact that experience and satisfaction are closely related is worthy of mention. However, whereas experience is how the customer feels during and after the interaction with the service offered by the brand, satisfaction is the direct consequence of the result of the process (San Martín Gutiérrez et al., 2008). In the case of digital channels, it can be said that the customer's expectations of how the technology enables the service will determine the experience (Kujala et al., 2017). Furthermore, a customer's expectations of the technology's capacity to offer the service will affect the satisfaction obtained (Bilgihan et al., 2015).

The degree of disconfirmation between the expectation and the result obtained will determine the experience obtained by the customer (Oliver, 2014; Michalco et al., 2015). Therefore, the greater the difference between what is expected and what is received, the greater the experience (positive or negative) obtained by the customer. Experience and disconfirmation function in the same direction (De Santiago, 2015; Pons, 2015; Action Coach, 2018; Círculo Marketing, 2018; Asociación para el Desarrollo de la Experiencia de Cliente [DEC], 2018; Deloitte, 2018; MdS, 2018). This discrepancy between what is expected and what is received becomes extremely important for individuals in situations in which they have a high degree of engagement in the process either because of the importance they give to the process (Peralta Montecinos, 2015) or because of one's

TABLE 3 | Reliability and validity of item and construct.

Dimension	Indicator	Value > 0.6	Cronbach's alpha; $\geq 0.70.8$	Composite reliability ≥ 0.6	AVE > 0.5	rho_A > 0.6	Q ² > 0.15	R ² ≤ 1
Expectations	EXPGL1	0.831	0.884	0.920	0.742	0.887	0.203	0.290
	EXPGL2	0.898						
	EXPGL3	0.842						
	EXPGL4	0.872						
Experience process	SAT11	0.948	0.873	0.940	0.887	0.879	0.564	0.666
	SAT12	0.936						
Perceived quality	CAIN1	0.845	0.953	0.958	0.607	0.958		
	CAIN2	0.694						
	CAIN3	0.844						
	CAIN4	0.834						
	CAIN5	0.815						
	CAIN6	Eliminated						
	CASE1	0.657						
	CASE2	0.619						
	CASE3	0.816						
	CASE4	0.838						
	CASE6	Eliminated						
	CASI1	0.663						
	CASI2	0.833						
	CASI3	0.766						
	CASI4	0.823						
	CASI5	0.765						
	CASI6	Eliminated						
	CASI7	0.816						
Perceived satisfaction	SAIN6AA	0.834	0.851	0.890	0.621	0.892	0.271	0.523
	SASE6AA	0.789						
	SASI6AA	0.855						
	SAUSSA	0.687						
	SASE6B	0.762						

expectations about the brand (Michalco et al., 2015), because this discrepancy surprises and alarms them (Geers et al., 2009). Where the level of engagement is low, therefore, the relationship between the expectation and the experience will be of little significance (Alba and Williams, 2013), though it should be understood that either the individual will modify or readjust their expectations or the experience will be adjusted to minimize the degree of disconfirmation. As can be deduced, for companies it is complex to provide experience and satisfaction from the fulfillment of expectations, given its subjective and therefore diverse nature. Thus, taking into consideration *contrast theory*, the customer will distort their expectations to fit the experience, thus enabling them to justify their choice (Pelegrín Borondo, 2013). On the other hand, according to *assimilation or dissonance theory*, the opposite may occur, with the consumer adapting the experience to the expectation in such a way as to produce a distortion of the reality (Raita and Oulasvirta, 2011; Oliver, 2014; Michalco et al., 2015). For this reason, this research considers how expectations influence before the process and after the process, that is, what you expected from the service and what impact its contrasts with what you received have on it.

Expectations are also considered a determinant of customer satisfaction. The individual will be satisfied to the extent that

the service they receive meets or exceeds what they expected (Ali et al., 2016), confirming their expectations in terms of the capacity of the service to respond to a need or resolve a problem (Oghuma et al., 2016). Contrary to what occurs with customer experience, when expectations are transformed into reality, the individual acquires a feeling of control over the medium and therefore experiences satisfaction, having avoided loss or harm (Guo et al., 2016; Zehrer and Raich, 2016).

In the current socioeconomic context, technology plays a decisive role in the relationship of expectations and perception of service by the user (Mallaina García, 2017; Molina et al., 2017; Rey-García et al., 2017). This research contextualizes the true role of customer expectations in the digital experience to determine how important the digital channel's impact on online customer and business interaction is. While the theoretical reference framework indicates that expectations also influence during the process and even beyond post-purchase (De Keyser and Larivière, 2014), the model allows to contextualize the customer's digital expectations and conclude which, while relevant to the consumer at the time of consumption before, perceived quality is the variable that most influences the experience during and after the digital transaction. Moreover, this experience directly influences satisfaction, regardless of the

TABLE 4 | Measurement instrument: discriminant validity.

	Expectations	Experience process	Quality	Satisfaction
Expectations	0.861			
Experience process	0.336	0.942		
Quality	0.495	0.813	0.779	
Satisfaction	0.345	0.715	0.73	0.788

TABLE 5 | Predictive relevance test: R^2 (maximization of the explained variance of the dependent variables); Q^2 or Stone-Geisser test and Q^2 offered by predictive PLS.

	R^2	$Q^2 (= 1 - SSE/SSO)$	Q^2 offered by predictive PLS
Customer Experience	0,666	0,585	0,665
Satisfaction	0,533	0,282	0,522

expectations formed before the consumption of the service (Ali et al., 2016).

On the other hand, the results of the research demonstrate the acquired importance of the web channel to the user in such a way that it becomes the object of specific future expectations in relation to (1) the operation of the platform, (2) the quality of the information that accompanies the process, (3) the technological implications of the service, and (4) the new customer–company relationship that arises thanks to the new channel (Zavareh et al., 2012).

Based on the arguments posited, the following hypotheses are formulated:

H1: *The customer's expectations of the result of the digital service directly impact on the customer's experience with that result.*

H2: *The customer's expectations of the result of the digital service directly impact on the customer's satisfaction with that result.*

Perceived Quality of the Digital Service

Service quality becomes increasingly important, since it is used as an additional element that enriches the offering and increases the value received by the customer (Guo et al., 2019). In particular, private customer web areas are presented as a medium for promotion of a closer, more interactive, and personalized customer–company relationship (Chang et al., 2014). This renders service quality a determinant in the customer's experience (Ali et al., 2016).

However, despite the interest aroused, the multidimensional nature of the concept means there is no consensus as to its definition (Cruz Sánchez et al., 2018). These authors define quality as excellence or the maximum quality achievable. Cruz (2004) defines quality as “the ability of the organization to ensure that its products and services meet their customers' implicit needs.” This definition is corroborated by ISO 9001:2015 (2016), which states that “quality is determined solely by the characteristics defined by the customer.” Worthy of note in this

respect is the fact that quality is as perceived by the individual and is dependent on personal taste and individual expectations (Méndez Aparicio, 2019).

The scientific literature has identified the various dimensions considered by individuals when evaluating the quality of a service. Of particular relevance is the research conducted in the 1990s by Zeithaml, Parasuraman and Berry, who identified as many as ten elements on which customers base their perceptions and expectations of quality (Parasuraman et al., 1994; Zeithaml and Bitner, 2002) and which have been a quality standard for many years.

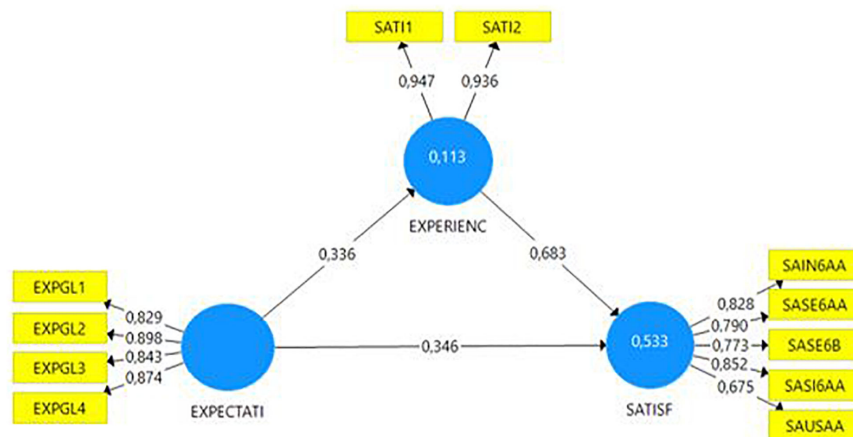
Despite the different characteristics of the digital environment, Alcaide Casado and Soriano Soriano (2006) conclude that the services offered in private customer web areas are not noticeably different from those provided in face-to-face services. Accordingly, researchers enumerated the following characteristics as equally necessary in a web service: *reliability, response capacity, professionalism, accessibility, courtesy, communication, credibility, security, knowledge of the customer, and tangible elements*. For Chang et al. (2014) and Wang et al. (2016), these attributes of quality guarantee the expected utility and are the elements upon which the customer will base their expectations. These characteristics will also condition the adoption of the digital channel as the habitual relationship with the brand (Izquierdo Yusta et al., 2011; Méndez Aparicio, 2019).

In Rather (2020), the customers will continuously evaluate the service quality during their interactions with the business. This has sparked the interest of companies in customer area technology management, who need to consolidate their digital relationship with the client. As responsible for customer satisfaction, companies must ensure success in their interaction with customers and how they feel during the process (Olarte-Pascual et al., 2016). Thus, multiple study proposals have measured the quality of digital service from multiple perspectives (Méndez Aparicio, 2019). Noteworthy is the study by Hsu et al. (2012) and Chang et al. (2014) that has allowed the identification of three determining dimensions of digital service quality: *technical quality, service quality, and information quality*. According to ISO Standard 25010 (ISO, 2019), these elements are sufficient to measure the quality of the website atmosphere (Kobusińska and Hsu, 2018; Shao et al., 2019).

This proposal is considered in this research as the most appropriate and complete, since it contemplates the three aspects of digital quality: the quality information that accompanies the user, the quality of the brand promise received, and the quality of the platform in the one that is served. However, despite being orderly and systematic, it suffers from important attributes, justified by other authors, such as security (Swaid and Wigand, 2012) and perceived risk in the service (Wai et al., 2019), essential in a virtual environment that must guarantee trust. Finally, it is also considered important to incorporate the efficiency or capacity to have the resources (services, systems, or information) necessary to achieve the desired service (Swaid and Wigand, 2012). Therefore, these aforementioned attributes will also be incorporated into the research to complete the gap detected in the frame of reference. Ultimately, this study aims to confirm whether the following digital attributes are indicators of customer

TABLE 6 | Hypothesis contrast analysis.

Hypothesis	Structural relationship	path coefficient (β)	Bootstrap-t value	Hypothesis contrast
H1	Expectations → Customer experience	− 0.087***	7.065	ACCEPTED
H2	Expectations → Satisfaction process	0.059***	8.350	ACCEPTED
H3	Perceived quality → Customer experience	0.856***	91.094	ACCEPTED
H4	Customer experience → Satisfaction	0.675***	69.331	ACCEPTED

*** $p < 0.01$.**FIGURE 2 |** Study of total effect of Expectations on Satisfaction during the Customer Experience.

experience and, therefore, can be considered as a benchmark for an excellent web atmosphere:

- The information must be relevant, unambiguous, concrete, sufficient, and up-to-date.
- The quality of the brand promise received must provide data-safe, interactive, comprehensive, and fast services.
- The platform on which the service is implemented must be free of navigation risks, have a multi-device adaptation, be reliable, easy to use, fast, and attractive.

It is clear that the customer's interaction with the organization depends on technological aspects, so that the quality of the software used determines accessibility, ease of use, speed, reliability, multi-device adaptation, and security of service delivery (Huang et al., 2015). The quality of the technical component also impacts on the usability of the app or the website, its appeal, and its capacity to generate a website atmosphere that improves the customer's experience (Michalco et al., 2015). The information that the company places at the customer's disposal is also key to the relationship (Swaid and Wigand, 2012). Having access to accurate, up-to-date, quality information facilitates and speeds up certain processes at the same time as it promotes trust and commitment to the brand on the part of the customer (Swaid and Wigand, 2012; Venkatesh et al., 2012). Finally, service quality presents a utility component that impacts on trust in the results obtained (Hsu and Lin, 2015; Wang et al., 2016), data handling security (Thakur and Srivastava, 2014), and, above all, complete service autonomy (Chang et al., 2014).

Based on the arguments posited, the following hypothesis is formulated:

H3: *The quality of the digital service impacts directly on the customer's experience.*

Customer Experience and Its Impact on Customer Satisfaction

Customer experience and satisfaction are among current business objectives. Despite being closely related, there are differences between the two concepts (San Martín Gutiérrez et al., 2008).

Experience is how the customer feels during and after the interaction with the service offered by the brand. It is defined by Lemon and Verhoef (2016) as memorable experience, and, along the same line of reasoning, by Tokman et al. (2007) as "surpassing all expectation, whether in shortfall or excess, and resulting in full satisfaction—or dissatisfaction—and a memorable experience." The same argument is shared by Oh et al. (2007), who point to the emotional nature of the experience, derived from "entertaining, pleasurable, memorable and striking encounters." In this way, as indicated by Vargo and Lusch (2014), the complete nature of the interaction, during which pleasurable experience combines with the utilitarian nature of cognitive, affective, physical, and social dimensions, creates memorable personal experiences (Adhikari and Bhattacharya, 2016).

Among the primary focuses of research into customer experience have been understanding how the set of emotions, sensations, and sensory images felt by the individual are interpreted and internalized (Walls et al., 2011; Duerig et al.,

2013) and stored in the memory (Sierra Diez et al., 2010; Asociación para el Desarrollo de la Experiencia de Cliente [DEC], 2017). Moreover, the fact is that, at the strategic level, companies do not only need the result of the different service encounters between the customer and the brand must be positive (The Human Brand report, Grass Roots, 2018). It is also essential for the brand to ensure the customer's personal involvement on a sensory, emotional, cognitive, physical, and relational level (Chathoth et al., 2014; Lemon and Verhoef, 2016).

The principal effects of the experience on the customer's behavior are another focus of interest in relation to this concept. Studies conducted by Evans et al. (2009) and Iannini (2010), among others, have demonstrated the strategic importance for companies of generating positive experiences in their customers. A positive experience establishes an emotional connection between the brand and the customer, which generates in the customer a positive response to the brand and motivates future behavior and interaction (Sierra Diez et al., 2010).

Satisfaction is confirmed as one of the primary results of experience and is defined in terms of the pleasure (Wang, 2011) and enjoyment (Ali et al., 2018) felt by the customer as a direct consequence of the result obtained from the service (Capgemini, 2020). However, it is also true that a key element of the end value provided by a service is determined by the way in which the service is offered; in other words, how the interaction between the customer and the brand was conducted (Ali et al., 2018). Thus, the inseparability of the production and consumption of the digital service conditions the result of the interaction and its capacity to deliver value and, therefore, the customer's experience (Alcaide Casado and Soriano Soriano, 2006; Vargo and Lusch, 2014). This consideration is relevant, since in previous studies developed in the effervescence of ICT, it is common to identify experience with hedonism, vandalizing the process from a commercial and playful perspective (Oh et al., 2007). However, as the results of the research show, the client highly values seeing their service expectations exceeded, when they obtain an excellent perceived quality and utility (Tsai et al., 2011). Therefore, this conclusion obtained is not only novel but relevant to connected users and in a current post-pandemic context due to COVID-19, in which new values such as effective, efficient, and safe service are becoming the levers for the use of the digital channel in the immediate future but also in the medium and long term, as Findasense indicates in the COVID-19 study of April 2020 (Findasense, 2020).

Finally, satisfaction is considered a fundamental objective in the company's strategy (Arango Serna et al., 2012; Hoekstra et al., 2015) because of its considerable impact on the customer's trust in the company (Lassala Navarré et al., 2010), on repeat purchases of products and services (Currás-Pérez and Sánchez-García, 2012; Prado Román et al., 2013), on repeated use of the channel (Mendoza-Tello et al., 2018), and on recommendations to third parties (Lin and Lekhawipat, 2014; Strong View, 2014; Méndez Aparicio, 2019).

This consideration makes this research necessary as it generates knowledge to design business strategies built on the customer experience (Triantafyllidou and Siomkos, 2014).

Based on the arguments posited, the following hypothesis is formulated:

H4: *The customer's experience of the result of the digital service impacts directly on their satisfaction with that result.*

MATERIALS AND METHODS

To be sure to choose a robust digital sample, it was therefore necessary to select a relevant company in the insurance business whose digital presence is indisputable (El Independiente, 2018; La Vanguardia, 2019), with plenty of customer area activity (21.000 monthly accesses). Only two criteria were taken into account in extracting the representative sample: (1) contractual continuity of three months and (2) having performed at least one operation in the private customer web areas during the previous month, to ensure the customer's familiarity with both the company and the channel. The requested online service covers any operation: contracting, claiming, or requesting insurance services. The scope includes auto, motorcycle, home, life, or savings insurance.

Once the state of the art had been reviewed, and the hypotheses and the model to be tested had been defined, in-depth interviews with experts were carried out to confirm the most appropriate indicators for the online channel and how the approach to the customer should take place.

To confirm the hypotheses formulated, 4 constructs were identified that would allow studying the underlying relationships questioned: *digital quality*, *expectations*, *experience*, and *customer satisfaction*. The corresponding reference framework was established on the proposed relationships and, in particular, in the digital context (see **Table 1**). Similarly, the most precise indicators that define them were defined: 4 items to measure expectations; 17 to assess the digital quality of the service; 2 for customer experience; and 5 to measure satisfaction. In total, 28 scales were incorporated into the definitive form, ratified again by experts, from the qualitative methodology proposed. The choice of an 11-point Likert scale ensured adequate variance in the responses (Bisquerra Alzina and Pérez Escoda, 2015) and enabled the subsequent treatment of the data according to groups of points obtained.

In June 2016, three mass mails were sent to the 23,223 sample candidates. The sample is indeed large to guarantee the required 95% confidence level and a sampling error of $\pm 1.5\%$. It also guarantees the behavior of more than 250,000 registered users, who carry out all kinds of operations. This is to avoid bias in the operation, age, and type of insurance that the client has. It should be added that the proposed sample size contemplated the possibility of studying segments of it. In this way, it is guaranteed that with a single fieldwork we could have enough population to study the influence of the client's previous attitude toward the company (NPS factor). As a future line of research, also work on the experience bias is produced by the platform: url / App. As a result of this, 4,178 valid surveys were obtained online (see

Table 2), in accordance with the required 95% confidence level. Participation was encouraged to increase response and interest in the research project.

The descriptive analysis indicated online users with an average age of 44; the majority (30%) aged between 36 and 45, followed by groups aged 26–35 and 46–55 years. The online purchase volume was once a month, the average being 3.9 purchases per month, far higher than the Spanish national average of 3.4 recorded in 2016 (iabSpain, 2016). The computer was the platform habitually used for the consumption of services (71.9%), though the use of smartphones was already identified as a growing trend, with 18.1% of users opting for m-commerce. A total of 78% of the users regularly used the digital medium for their transactions; 79% expressed a preference for it because of the convenience of the operating hours. A total of 88.4% of the respondents had not used the App.

The digital profile obtained was fully current in 2018 (iabSpain, 2018); hence, the results were valid, providing a sample of expert users able to objectively evaluate website quality without any issues of poor adjustment to technology, producing biases with respect to perceived satisfaction.

The proposed relational model was validated using partial least squares structural equation modeling (PLS/SEM) (statistical output of SmartPLS 3, confirmed in the **Figure 1**) and Smart PLS 3.0 software (Ringle et al., 2015). Using a bootstrap sampling technique, the 10,000 repetitions performed (Hair et al., 2017) ensured the individual reliability of the item, the scale, the convergent validity, and the discriminant validity obtained through Cronbach's alpha statistics, composite reliability, % of accumulated variance, the determinant of the correlation matrix, the Barlett test of sphericity, and the KMO index, as well as other important reliability statistics for PLS, such as R^2 and the Stone-Geisser and Q2 index offered by the PLS predict. Thanks to verification, the reliability and validity of the items and constructs, as well as their predictive capacity, were confirmed, as will be seen in the results.

RESULTS

Partial least squares structural equation modelling uses a two-step estimation process: evaluation of the measurement model and the structural model. To analyze the measurement model, it is necessary to assess the reliability, convergent validity, and discriminant validity. As we can observe in **Table 3**, to ensure item validity, items with values less than 0.7 were removed (Bagozzi and Yi, 2012). The composite reliability (CR) and Cronbach's alpha were calculated in the same way for values greater than 0.7 (Cronbach, 1951; Malhotra, 2008). The average variance extracted (AVE) was contrasted with the recommended value equal to or greater than 0.5, as indicated by Fornell and Larcker (1981). The rho_A coefficient (Dijkstra and Henseler, 2015) with a value close to 1.0 indicated the reliability of the model analyzed with PLS. The discriminant validity of the measurement model was also accepted where a given construct was different to the others (Authors' note: It should be noted that this measurement is only applicable to constructs with reflective

indicators, as is the case in this research project.) Fornell and Larcker (1981) established the need for the variance shared between a given variable and its attributes to be greater than that shared with the other variables of the proposed model, as we can observe in **Table 4**. The diagonal of **Table 4** shows the value of the square root of the AVE for the corresponding construct, which met the criterion that the correlations between constructs must be less than the square root of the AVE.

As we can observe in **Table 5**, the predictive capacity of the constructs is also confirmed. Using the Stone-Geisser test, the values obtained for Q2 in customer experience of 0.585, Q^2 by predictive PLS of 0.665, exceed by far the theoretical threshold of 0.35 for highly predictive constructs (García Haro, 2018). The same happens with the satisfaction construct, with values of 0.282 and 0.522, respectively. Regarding the values of R^2 (maximizing the explained variance of the dependent variables, Chin and Newsted, 1999), The values obtained for customer experience (0.666) and satisfaction (0.533), higher than 0.5, confirm the robustness of both constructs.

Finally, the measurement model is analyzed. As we can observe from **Table 6**, all the proposed hypotheses were accepted. Coefficients with a 99% confidence level were accepted, using Student's *t*-test values greater (in absolute value) than 2.58, and where a *p*-value of less than 0.01 was satisfied. The path coefficient values (β), or standardized regression coefficients, indicated a strong relationship between both digital customer quality and experience ($\beta = 0.856$; $p < 0.01$; **H3**) and customer experience and satisfaction ($\beta = 0.675$; $p < 0.01$; **H4**). The hypothesis regarding the influence of expectations on customer experience was accepted despite the negative value of the path coefficient, which indicated a negative correlation between two variables ($\beta = -0.087$; $p < 0.01$; **H1**). Given the robustness obtained from the *p*-value and bootstrap-*t* statistics for both hypotheses (**Table 6**), the relationship between expectations and satisfaction ($\beta = 0.059$; $p < 0.01$; **H2**) was also accepted, despite the low value of the path coefficient (β). Moreover, **H1** and **H2** were admitted on the basis of the conclusions obtained from studying the measurement of customer experience according to expectations and satisfaction (statistical output of SmartPLS 3, confirmed in **Figure 2**), whereby the path coefficient (β) values for **H1** ($\beta = 0.336$; $p < 0.01$; **H1**) and **H2** ($\beta = 0.346$; $p < 0.01$; **H2**) are highly significant, as we will argue below.

CONCLUSION

The proposed client-company relationship model investigates the underlying relationship between user expectations in the face of virtual interaction, digital quality, and experience and perceived satisfaction in private insurance areas. As can be seen in the results, the model is robust and highly conclusive to predict customer experience in private insurance web areas. Whereas the usual theoretical framework places the primary focus of interest on attracting new users, this analysis enables a different perspective which stresses the importance of research into the omni-channel experience of registered users.

There are extensive and continual examples in the literature which directly link quality to customer satisfaction (Hoekstra et al., 2015; Héctor San Martín et al., 2019) and which even include service experience attributes among their value scales (Al Sokkar and Law, 2013; Bilgihan et al., 2015). However, it has become necessary to include the perspective of the event or service that produces it (Walls et al., 2011; Lourido Gómez and Otero Neira, 2016; Olarte-Pascual et al., 2016; Pelegrín-Borondo et al., 2017), applying a behavioral model to independently study how quality is experienced differently by the customer at different stages during the process: what they expected before experiencing the service (Basfirinci and Mitra, 2015; Kujala et al., 2017) and whether their expectations were fulfilled (Hall, 2012; Oliver, 2014), or even surpassed, in absolute terms (Michalco et al., 2015; Schmitt et al., 2015). The impact of the “wow” effect on customer satisfaction is amply demonstrated in the fourth hypothesis, **H4**. This conclusion is important for business growth management strategy in terms of generating both customer loyalty (Yoo et al., 2013; Lin and Lekhawipat, 2014; Ali et al., 2018) and consolidation of the use of the digital channel used (Brown et al., 2014).

With respect to quality, and as we were able to observe by comparing **Figures 1, 2**, a comprehensive study of the model enables us to draw five important conclusions:

- (1) The importance of digital quality in customer experience is corroborated in **H3**, to the point of significantly altering the value of the path coefficient (β) in terms of what the customer expects of the service in the absence of this construct. This situation confirms that expectations are relevant in a hypothetical model of the customer–company relationship (Izquierdo-Yusta et al., 2015; Wang et al., 2016), but it is the perceived quality that should characterize an area of clients (Al-Debei et al., 2015; Hoekstra et al., 2015). Affirmation, albeit intuitive, affords insurance companies the invaluable opportunity to achieve a definitive customer experience, by ensuring high digital quality, in accordance with the company's reputation (De Quevedo et al., 2005), technological innovation (Jiménez-Zarco et al., 2019), previous experience (Thakur and Srivastava, 2014), and third-party recommendations (Roy et al., 2013; Esteban et al., 2014; Méndez-Aparicio et al., 2017), in a novel and surprising, unpredictable way (Ngo and O'Cass, 2013; Skålén et al., 2015). In this process, co-creation with the virtual user not only provides essential information for web designers about what the ideal digital service should look like (Romero and Molina, 2011) and what needs it must meet (Hoyer et al., 2010), which improves its implementation (Kristensson et al., 2008), but generates creative ideas (Ramaswamy and Chopra, 2014; Martínez-Cañas et al., 2016), highly valued by the client participating in the process (Kristensson et al., 2008; Martínez-Cañas et al., 2016) and strengthening and consolidating the relationship between company and customer (García Haro, 2018).
- (2) The importance of information as the most valued digital quality attribute in private insurance areas. According to ISO Standard 25010, the relative importance of eighteen

characteristics must be considered when designing and consolidating a better, more highly regarded web channel. The first and most visible characteristic is the contribution to the construct of the information architecture, which must be *relevant, detailed, current, precise, and sufficient* (Chang et al., 2014), in accordance with the customer's expectations (factor 0.898). The importance of information is understandable within the concept of digital self-service in insurance web areas, and the model confirms the client's positive assessment of experiencing services where the intervention of a support agent is not necessary (Palm, 2016). This doubly satisfies the user: first, the private area responds to their new digital habits, and second, the customer feels accompanied in the service of a product called an *experience product* (Gómez Borja, 2014).

- (3) The implementation of the platform is relevant in the new behavioral economy (Comisión nacional de los Mercados y la Competencia [CNMC], 2019). Next in order of importance are *speed* (Swaaid and Wigand, 2012), *multidevice adaptation* (Huang et al., 2015), *reliability* (Kobusińska and Hsu, 2018), and *ease of use* (Bilgihan et al., 2015). With respect to the lesser-valued characteristics, it is noteworthy that key characteristics for *service and system security*, so crucial to a virtual medium (Chang et al., 2014), have lost digital quality measurement value, probably on the basis of the company's reputation for ethics and honesty (Caruana et al., 2015). In sum, and in corroboration of the importance of the relationship between quality and experience, it can be said that *system quality* provides the greatest customer satisfaction, that is, how the service has been implemented (load factor of 0.855), very appropriate in a channel in the process of consolidation and confirming the importance of technology in customer satisfaction with virtual service (Al Sokkar and Law, 2013; Michalco et al., 2015).
- (4) Digital customer experience acts as a partial mediator on the model (the variance accounted for variable—VAF—of 40% ensures partial mediation, Hair et al., 2017), reinforcing the total effect of customer expectations on the satisfaction, due to the corresponding “wow” effect on the user. This conclusion is significant in the research framework, since the confirmation of expectations has traditionally been regarded as the determinant of satisfaction (**H2**) (Oliver, 2014). However, the full potential is demonstrated when the customer's expectations can be surpassed (**H1**) (Michalco et al., 2015).
- (5) The importance of expectations in the model. Pelegrín Borondo (2013) reflects on the type of expectation the user establishes compared to the experience they receive, from which we can infer that the change of sign of the expectations–experience effect may be due to an absence of the “wow” effect (factor 0.936), the projected ideal (Hall, 2012), whereby objectives are merely fulfilled, in a regulation or predictable way (factor 0.948) (Oliver and Burke, 1999). However, as stated by Michalco et al. (2015), it is common for customers to experience a distortion of their expectations (Huang et al., 2015) or of reality (Raita and Oulasvirta, 2011), from which we deduce

that the difficulty faced by companies in managing the customer experience can only be solved with the proper information architecture (the most-valued characteristic), where what happens and what is expected are a single entity. The properly informed user will also be more sensitive to qualitative changes, meaning that companies must maintain speed, functionality, appeal, and challenge but manage the “wow” effect wisely in their private customer web areas to maintain the vibrance of use of the channel, essential in the new knowledge economy (Rodríguez-Ardura et al., 2018).

THEORETICAL IMPLICATIONS AND MANAGEMENT IMPLICATIONS

Key economic observers (Berger, 2017; Instituto Nacional de Estadística [INE], 2018a,b; iabSpain, 2018) augur a significant impact of digital transformation on countries' economic growth in an imminent timeframe. As indicated by the DESI Index (Digital Economy and Society Index), the level of competitiveness of companies in the European Union evolves according to expectations and the digitization of data management (storage and sharing of open data, (Comisión Nacional del Mercado de Valores [CNMV], 2019), although it is true that it is very disparate according to economic sectors and countries (Paradigma Digital, Rodríguez Calvente, 2019).

However, there are serious indications that warn of the danger of turning digital transformation into a technological renewal rather than a new approach to customer encounter in market developments (It User, 2018). A redesign of the services according to the expectations of the clients is necessary (Congress DEC 2019).

The insurance field is a traditional sector that provides so-called experience products. The perception of the risk of this type of services means that the adoption of the channel was not relevant until the very recent past (Inese, 2018). Customers prefer face-to-face channels to ensure information and personal treatment by agents from whom they obtain security (Minsait, Asociación para el Desarrollo de la Experiencia de Cliente (DEC), 2019 report on digitization in Spain). The idea that “customers don't just buy products or services; they also buy experiences and relationships” (Liferay Inc, 2019) is evidence, and competitive pressure and centrality vision (Kohli et al., 2019) impose a roadmap of no return in the digital transformation of the insurance sector. That is why it is considered relevant to present a contrasted behavior model that facilitates the implementation of the digital channel by the insurance sector, within the investigative prudence on the bias that the sample may present at the international level.

These results are more relevant than ever in the pandemic stage experienced in 2020, where society has faced unprecedented digitization and where only platforms where the customer has been taken into account and from impeccably implemented services have triumphed. According to the Capgemini Global Report (2020), customers are adopting a “millennial” mindset

and increasingly relying on their own judgment based on information on the Internet and purchasing insurance products themselves. Thus, bigtech and alerted providers offer innovative and personalized products that offer a better customer experience (CX), within a competitive strategy, also unprecedented. That is why all new research is relevant as it provides knowledge to companies in their career for digital transformation and digital customer orientation.

Therefore, this article aims to highlight the relevance of the digital service as an added value for the customer. To do this, the article proposes to the scientific and insurance business community the model of customer experience, related to satisfaction and expectations and considers the following recommendations based on the results obtained. At the theoretical level, this article reinforces the theoretical framework on the customer experience, scarce in the reference literature that has usually focused on perceived satisfaction. The statistical robustness of the construct allows to consider its determinants as predictive of the customer experience. Although the variables of the model are a well-known benchmark in the field of multisectoral and omni-channel customer behavior research, the proposed model questions the relevance of expectations in the digital field of insurance and raises a new vision where it is established that it is the quality that determines a true customer experience in this context. Thus, the theory initiated by Davis (1989) and fully current to this day is questionable in the field of private insurance areas. That is, the idea that the user's attitude toward technology conditions their use of it and that this attitude becomes an evaluative judgment on the digital channel (Worchel et al., 2003) can be solved by brands from an excellent digital quality and from co-creation with the user.

Therefore, it can be concluded that the model determines the true role of expectations, which, while important in the pre-digital phase, is the perceived quality that determines the true customer experience. On the other hand, surprising the client digitally is revealed as a guarantor of their satisfaction, as the predictive nature of both constructs is statistically confirmed. This is a remarkable discovery compared to the competition and the benefits it entails since it allows the “industrialization” of the customer experience, absolutely current in the new customer centrality vision.

Finally, and in the context of co-creation, the study provides an exhaustive study of quality based on the grouping of attributes based on its objective: platform, service performed, and information. This has made it possible to highlight the relevance of the information in the digital service as well as the perceived usefulness of the channel with respect to the service achieved. Knowing the digital attributes most valued by users allows the implementation of more ergonomic platforms open to joint innovation. That is, by creating an authentic digital experience, the adoption of the channel by customers is guaranteed, in which companies can establish a continuous and open dialog with them, which favors retention and recommendation to their influence groups.

On a practical level, insurance companies should monitor the implementation of their website, where it should encourage the use of the web channel to ensure training in the website, achieve

an adequate web atmosphere that replaces the agent, look for the wow factor in the user that impact on recommendation, strengthen digital trust in channel usage, coordinate brand communities to achieve fidelity and recommendation, and invest in customer knowledge through “Digital Customer Voice” programs and know their needs.

Translated into concrete recommendations, insurance companies are advised to monitor and incentivize the following points in their digital strategy:

- The private area must be provided with a correct information architecture that facilitates the service autonomously, since it is one of the most valued quality attributes in risk products and even more so when they are provided from digital self-services.
- In the insurance sector, trust is the basis of the service. For this reason, extreme software quality strengthens trust and reliability. Ensure that transactions are carried out efficiently and securely and the continuous availability.
- Provide the perceived utility channel, implementing the most demanded and complete services from start to finish. Achieving the purpose of the service is one of the pillars of the digital customer experience.
- Know the customer, identify profiles, and listen to their needs through “Voice Of Customer Programs” so that it is possible to customize the services, according to their expectations. Know the customer, identify profiles, and listen to their needs through “Voice Of Customer Programs” so that it is possible to customize the services, according to their expectations.
- Incorporate the customer in the decision-making and co-creation processes of digital services. According to the latest report on global insurance from the Capgemini consultancy (2020), hyper-personalization is the key. Not only does it provide information and improve deployment but also it gives value to the customer and strengthens the relationship with the company.
- Dose the surprise effect, with continuous but adequate changes of the private customer web areas and always from the acquired knowledge of its users. Exceeding the expectations of the insurance user guarantees the customer experience and satisfaction.
- Provide complete services from an omni-channel strategy. Adapt the web strategy, so that the perception of the client is omni-channel and according to the reputation and brand image and innovation of the company.
- Improve the sense of community through proper management of customer areas from a progressive approach to new technologies. Digital expectations are not

easy to standardize so they require a careful approach to them to encourage their adoption.

FUTURE LINES OF RESEARCH AND LIMITATIONS

The main limitation of the present study lies in the selected sample, i.e., insurance company customers. Subsequent research should seek to test the model in another industry with several different products and/or services. For the same reason, the selection of a single company may produce potential bias in the response, since the customer's relationship with the company may distort the reality they perceive, as explained by cognitive dissonance theory. To overcome this limitation, we propose a study across many companies in different sectors.

Future studies should also include additional client profile variables, such as frequency of use (indicator of previous experience). This will enable a company to anticipate and manage the “wow” effect on an informed user, avoid any potential distortion of expectations and its corresponding impact on the customer's experience, and shrewdly ration the (highly valued) information required throughout the process.

Finally, we wish to add that the digital customer experience continues to be analyzed in ideological or statistic-descriptive terms in companies, which makes it necessary to contribute to the creation of a new model. Moreover, the creation of new relationships is being driven by new digital quality characteristics oriented toward m-commerce, as well as by customers' emotions (Boston Consulting Group, 2018) and how these affect their connection to a brand.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

REFERENCES

- Action Coach, (2018). *Efecto Wow. Coach de Negocios*. Available online at: <http://coachdenegocios.com> (accessed August 16, 2019).
- Adhikari, A., and Bhattacharya, S. (2016). Appraisal of literature on customer experience in tourism sector: review and framework. *Curr. Issues Tour.* 19, 296–321. doi: 10.1080/13683500.2015.1082538
- Al Sokkar, A., and Law, E. (2013). “Validating an episodic UX model on online shopping decision making: A survey study with B2C e-commerce,” in *5th ACM*

- SIGCHI Symposium on Engineering Interactive Computing Systems (EICS '13), (New York, NY: ACM), 297–306.
- Alba, J. W., and Williams, E. F. (2013). Pleasure principles: A review of research on hedonic consumption. *J. Consum. Psychol.* 23, 2–18. doi: 10.1016/j.jcps.2012.07.003
- Alcaide Casado, J. A., and Soriano Soriano, C. L. (2006). *Marketing de servicios profesionales: guía para un marketing eficaz en despachos y negocios profesionales*. Delta Ideas.
- Al-Debei, M. M., Akroush, M. N., and Ashouri, M. I. (2015). Consumer attitudes towards online shopping: the effects of trust, perceived benefits, and perceived web quality. *Internet Res.* 25, 707–733. doi: 10.1108/intr-05-2014-0146
- Ali, F., Hussain, K., and Omar, R. (2016). Diagnosing customers experience, emotions and satisfaction in Malaysian resort hotels. *Eur. J. Tour. Res.* 12, 25–40.
- Ali, F., Hussain, K., and Ragavan, N. A. (2014). Memorable customer experience: examining the effects of customers experience on memories and loyalty in Malaysian resort hotels. *Proc. Soc. Behav. Sci.* 144, 273–279. doi: 10.1016/j.sbspro.2014.07.296
- Ali, F., Kim, W. G., Li, J., and Jeon, H. M. (2018). Make it delightful: Customers' experience, satisfaction and loyalty in Malaysian theme parks. *J. Destin. Market. Manag.* 7, 1–11. doi: 10.1016/j.jdm.2016.05.003
- Amezua, I. d. I. R. (2019). Insurtech, ética y seguros: cómo las nuevas tecnologías impactan en los seguros desde el punto de vista ético. *Bolet. Estud. Econ.* 74, 71–99.
- Arango Serna, M. D., Serna Urán, C. A., and Pérez Ortega, G. (2012). La gestión de indicadores empresariales con lógica difusa para la toma de decisiones. *Lámpasakos* 1, 47–53. doi: 10.21501/21454086.678
- Asociación para el Desarrollo de la Experiencia de Cliente [DEC] (2017). *La Experiencia de Cliente Rentable*. Libro colaborativo. Ed. DEC, Madrid.
- Asociación para el Desarrollo de la Experiencia de Cliente [DEC] (2018). *Informes de gestión*. Available online at: <https://asociaciondec.org/eventos/presentacion-informes-dec/> (accessed November 16, 2019).
- Asociación para el Desarrollo de la Experiencia de Cliente (DEC) (2019). *Congreso VI DEC. Behavioral economics. Cómo influir en la toma de decisiones a través de la Experiencia de Cliente*. Available online at: <https://asociaciondec.org/eventos/congreso/congreso-2019/> (accessed February 3, 2020).
- Bagozzi, R. P., and Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *J. Acad. Market. Sci.* 40, 8–34. doi: 10.1007/s11747-011-0278-x
- Basfirinci, C., and Mitra, A. (2015). A cross cultural investigation of airlines service quality through integration of Servqual and the Kano model. *J. Air Transp. Manag.* 42, 239–248. doi: 10.1016/j.jairtraman.2014.11.005
- Bauer, H. H., Falk, T., and Hammerschmidt, M. (2006). eTransQual: a transaction process-based approach for capturing service quality in online shopping. *J. Bus. Res.* 59, 866–875. doi: 10.1016/j.jbusres.2006.01.021
- Berger, R. (2017). *Avance Hacia la Digitalización*. Available online at: <http://www.expansion.com/economia-digital/companias/2017/06/20/592c636c22601dfa458b458f.html> (accessed February 3, 2020).
- Bilgihan, A., Barreda, A., Okumus, F., and Nusair, K. (2016). Consumer perception of knowledge sharing in travel related online social networks. *Tour. Manag.* 52, 287–296. doi: 10.1016/j.tourman.2015.07.002
- Bilgihan, A., Kandampully, J., and Zhang, T. (2015). Towards a unified customer experience in online shopping environments. Antecedents and outcomes. *Int. J. Q. Serv. Sci.* 8, 102–119. doi: 10.1108/IJQSS-07-2015-0054
- Bisqueria Alzina, R., and Pérez Escoda, N. (2015). Pueden las escalas likert aumentar en sensibilidad? *Revista d'Innovació Recerca Educació* 8, 129–147.
- Blut, M., Beatty, S. E., Evanschitzky, H., and Brock, C. (2014). The impact of service characteristics on the switching costs–customer loyalty link. *J. Retail.* 90, 275–290. doi: 10.1016/j.jretai.2014.04.003
- Boston Consulting Group, (2018). *Informe BCG-DEC. Reinventarse: El gran reto de la Experiencia de Cliente. Estudio integral sobre la Experiencia de Cliente en España Evolución 2016-2018*. Available online at: https://asociaciondec.org/informes-dec/informe-dec_bcg-reinventarse-el-gran-reto-de-la-experiencia-de-cliente/35680/ (accessed July 15, 2019).
- Brown, S. A., Venkatesh, V., and Goyal, S. (2014). Expectation confirmation in information systems research: a test of six competing models. *MIS Q.* 38, 729–756. doi: 10.25300/misq/2014/38.3.05
- Cai, S., and Jun, M. (2003). Internet users' perceptions of online service quality: a comparison of online buyers and information searchers. *Managing Serv. Q. Int. J.* 13, 504–519. doi: 10.1108/09604520310506568
- Capgemini. (2020). *Informe mundial del seguro 2020 de Capgemini*. Available at <https://www.capgemini.com/es-es/news/informe-mundial-del-seguro-2020-de-capgemini/> (accessed August 12, 2020).
- Carù, A., and Cova, B. (2008). Small versus big stories in framing consumption experiences. *Q. Market Res. Int. J.* 14, 166–176. doi: 10.1108/13522750810864422
- Carù, A., and Cova, B. (2013). “Consuming experiences: an introduction,” in *Consuming experience*, eds A. Carù, and B. Cova. (London: Routledge), 17–30.
- Caruana, A., and Ewing, M. T. (2006). The psychometric properties of eTail quality: an international investigation across product categories. *Int. Market. Rev.* 23, 353–370. doi: 10.1108/02651330610678958
- Caruana, A., Ramasashan, B., and Krentler, K. A. (2015). “Corporate reputation, customer satisfaction, and customer loyalty: what is the relationship?” in *Assessing the Different Roles of Marketing Theory and Practice in the Jaws of Economic Uncertainty*, ed. H. Spotts, (Cham: Springer), 301–301. doi: 10.1007/978-3-319-11845-1_102
- Chang, K. C., Kuo, N. T., Hsu, C. L., and Cheng, Y. S. (2014). The impact of website quality and perceived trust on customer purchase intention in the hotel sector: website brand and perceived value as moderators. *Int. J. Innovat. Manag. Technol.* 5:255.
- Chathoth, P. K., Ungson, G. R., Altinay, L., Chan, E. S., Harrington, R., and Okumus, F. (2014). Barriers affecting organisational adoption of higher order customer engagement in tourism service interactions. *Tour. Manag.* 42, 181–193. doi: 10.1016/j.tourman.2013.12.002
- Chen, C., and Phou, S. (2013). A closer look at destination: Image, personality, relationship and loyalty. *Tour. Manag.* 36, 269–278. doi: 10.1016/j.tourman.2012.11.015
- Cheung, C. M., Liu, I. L., and Lee, M. K. (2015). How online social interactions influence customer information contribution behavior in online social shopping communities: a social learning theory perspective. *J. Associat. Informat. Sci. Technol.* 66, 2511–2521. doi: 10.1002/asi.23340
- Chin, W., and Newsted, P. (1999). “Structural equation modeling analysis with small samples using partial least squares,” in *Statistical Strategies for Small Sample Research*, ed. R. H. Hoyle, (Thousand Oaks, CA: Sage Publications).
- Círculo Marketing (2018). Efecto wow. Marketing. Available online at: <http://www.circulomarketingla.com> (accessed October 14, 2019).
- Comisión nacional de los Mercados y la Competencia [CNMC] (2019). *El comercio electrónico supera en España los 10.000 millones de euros en el tercer trimestre de 2018, casi un 30% más que el año anterior*. Available online at: <https://www.cnmc.es/gl/node/374284> (accessed February 10, 2020).
- Comisión Nacional del Mercado de Valores [CNMV] (2019). *Distribución Comercio Electrónico en España 2018*. Available online at: [https://www.Temp1_comercio_electronico_IIT_2018%20\(1\).zip/Nota_de_prensa_CE_II_18.pdf](https://www.Temp1_comercio_electronico_IIT_2018%20(1).zip/Nota_de_prensa_CE_II_18.pdf) (accessed February 10, 2020).
- Cox, J., and Dale, B. G. (2001). Service quality and e-commerce: an exploratory analysis. *Managing Serv. Q.* 11, 121–131. doi: 10.1108/09604520110387257
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika* 16, 297–334. doi: 10.1007/bf02310555
- Cruz, J. (2004). Cuánto cuesta la calidad. *Innovaciones Negocios* 2, 259–276.
- Cruz Sánchez, A., Orduña Carlos, M. D., and Álvarez Hernández, J. G. (2018). Evolución del concepto de calidad y los modelos de medición de calidad en el servicio. *Innovaciones Negocios* 15, 259–278.
- Currás-Pérez, R., and Sánchez-García, I. (2012). Satisfaction and loyalty to a website: the moderating effect of perceived risk. *Esic Mark. Econ. Bus. J.* 141, 183–207.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13, 319–340. doi: 10.2307/249008
- De Keyser, A., and Larivière, B. (2014). How technical and functional service quality drive consumer happiness: moderating influences of channel usage. *J. Serv. Manag.* 25, 30–48. doi: 10.1108/JOSM-04-2013-0109
- De Mooij, M. (2019). *Consumer Behavior and Culture: Consequences for Global Marketing and Advertising*. New York, NY: SAGE Publications Limited.
- De Quevedo, E., De la Fuente, J. M., and Delgado, J. B. (2005). Reputación corporativa y creación de valor. marco teórico de una relación circular. *Investigaciones Europeas Dirección Economía Empresa* 11, 81–97.

- De Santiago, D. (2015). *Buscando el Efecto 'WOW' en Ecommerce*. Available online at: <https://ecommerce-news.es/buscando-el-efecto-wow-en-ecommerce-31148> (accessed 21 August 21, 2019).
- Deloitte (2017). *De la teoría a la acción. 1er estudio sobre la madurez de la Gestión de la Experiencia de Cliente en el sector B2B en España*. Available online at: <https://asociaciondec.org/eventos/estudio-dec-deloitte-digital-cx-b2b/18069/> (accessed June 13, 2019).
- Deloitte (2018). *II Informe sobre la Operativización de la Voz de Cliente*. Available online at: <https://www2.deloitte.com/us/en.html> (accessed June 22, 2019).
- Dijkstra, T., and Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Q.* 39, 297–316.
- Duerig, T. W., Melton, K. N., and Stöckel, D. (2013). *Engineering Aspects of Shape Memory Alloys*. London: Butterworth-Heinemann.
- EIOPA (2017). *How Technology and Data are Reshaping the Insurance Landscape*. Available online at: https://register.eiopa.europa.eu/Publications/Reports/08_0_EIOPA-BoS17-165_EIOPA_InsurTech_Roundtable_summary.pdf (accessed 9 April 9, 2020).
- El Independiente (2018). *Crecimiento de Mutua Madrileña. Datos de crecimiento orgánico. Mutua Madrileña, la aseguradora que más crece en 2017 entre las principales del sector*. Available online at: <https://www.elindependiente.com/economia/2018/01/24/mutua-madrileña-aseguradora-mas-crece-2017/> (accessed April 9, 2020).
- Esteban, A. A., Ballester, M. E. D., and Muñoz, J. P. (2014). Quién ama a las marcas? Determinantes personales y de consumo. *Revista Española Investigación Marketing ESIC* 18, 2–16. doi: 10.1016/S1138-1442(14)60002-4
- Evans, M., Jamal, A., and Foxall, G. (2009). *Consumer Behaviour*. Oxford: Wiley Publications.
- Findasense (2020). *Estudio COVID-19. Escenarios y Horizontes de Futuro Post-Cuarentena en el Consumo y la Producción*. Available online at: <https://es.insights.findasense.com/estudios/covid-19-paper-futuro-del-consumo-y-la-produccion-66508> (accessed August 12, 2020).
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312
- García, J. (2010). *El seguro ético y solidario*. Available online at: <https://issuu.com/deustobusinessalumni/docs/boletin226> (accessed April 9, 2020).
- García Haro, M. A. (2018). *La co-creación de valor a través de los social media: efecto en la imagen de Cuenca como destino turístico*. Doctoral tesis, Universidad de Castilla-La Mancha, Ciudad Real.
- Geers, A. L., Wellman, J. A., and Lassiter, G. D. (2009). Dispositional optimism and engagement: the moderating influence of goal prioritization. *J. Pers. Soc. Psychol.* 96, 913–932. doi: 10.1037/a0014830
- Gefen, D., Karahanna, E., and Straub, D. W. (2003). Trust and TAM in online shopping: an integrated model. *MIS Q.* 27, 51–90. doi: 10.2307/30036519
- Gómez Borja, M. A. (2014). *El Proceso de Decisión en el Consumidor*. Barcelona: Universitat Oberta de Catalunya.
- Grass Roots. (2018). *The HUMAN Brand : Un Diagnóstico del Mercado Español. Informe para DEC*. Available online at: <https://asociaciondec.org/presentacion-informe-the-human-brand/> (accessed September 16, 2019).
- Guadarrama Tavira, E., and Rosales Estrada, E. (2015). Marketing relacional: valor, satisfacción, lealtad y retención del cliente. Análisis y reflexión teórica. *Cienc. Soc.* 40, 307–340. doi: 10.22206/cys.2015.v40i2.pp307-340
- Guo, C., Kulviwat, S., Zhu, J., and Wang, Y. J. (2019). Competing in an emerging market: antecedents and consequences of market orientation and the role of environmental factors. *J. Strateg. Mark.* 27, 248–267. doi: 10.1080/0965254x.2017.1411386
- Guo, L., Lotz, S. L., Tang, C., and Gruen, T. W. (2016). The role of perceived control in customer value cocreation and service recovery evaluation. *J. Serv. Res.* 19, 39–56. doi: 10.1177/1094670515597213
- Hair, J. F. Jr., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd Edn. Thousand Oaks, CA: Sage.
- Hall, J. A. (2012). Friendship standards: the dimensions of ideal expectations. *J. Soc. Pers. Relatsh.* 29, 884–907. doi: 10.1177/0265407512448274
- Han, H., and Hyun, S. S. (2015). Customer retention in the medical tourism industry: impact of quality, satisfaction, trust, and price reasonableness. *Tour. Manag.* 46, 20–29. doi: 10.1016/j.tourman.2014.06.003
- Hartmann, J., De Angeli, A., and Sutcliffe, A. (2008). “Framing the user experience: information biases on website quality judgement,” in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '08)* (New York, NY: ACM), 855–864.
- Héctor San Martín, H., Herrero, A., and García de los Salmones, MdM (2019). An integrative model of destination brand equity and tourist satisfaction. *Curr. Issues Tour.* 22, 1992–2013. doi: 10.1080/13683500.2018.1428286
- Hoekstra, J. C., Huizingh, E. K., Bijmolt, T. H., and Krawczyk, A. C. (2015). Providing information and enabling transactions: which web site function is more important for success? *J. Electr. Comm. Res.* 16, 81–94.
- Holbrook, M. B., and Hirschman, E. C. (1982). The experiential aspects of consumption: consumer fantasies, feelings, and fun. *J. Consum. Res.* 9, 132–140. doi: 10.1086/208906
- Hoyer, W., Chandy, R., Dorotic, M., Krafft, M., and Singh, S. (2010). Consumer cocreation in new product development. *J. Serv. Res.* 13, 283–296. doi: 10.1177/1094670510375604
- Hsu, C. L., and Lin, J. C. C. (2015). What drives purchase intention for paid mobile apps? An expectation confirmation model with perceived value. *Electron. Commer. Res. Applicat.* 14, 46–57. doi: 10.1016/j.elerap.2014.11.003
- Hsu, C. L., Chang, K. C., and Chen, M. C. (2012). The impact of website quality on customer satisfaction and purchase intention: perceived playfulness and perceived flow as mediators. *Inform. Syst. e-Bus. Manag.* 10, 549–570. doi: 10.1007/s10257-011-0181-5
- Huang, E. Y., Lin, S. W., and Fan, Y. C. (2015). MS-QUAL: mobile service quality measurement. *Electron. Commer. Res. Applicat.* 14, 126–142. doi: 10.1016/j.elerap.2015.01.003
- iabSpain, (2016). *Estudio anual de eCommerce España*. Available online at: http://www.iabspain.net/wp-content/uploads/downloads/2016/06/Estudio-eCommerce-IAB-2016_VPública1.pdf (accessed August 18, 2019).
- iabSpain, (2018). *Estudio anual de eCommerce España 2018*. Available online at: https://iabspain.es/wp-content/uploads/estudio-ecommerce-iab-2018_vcorta.pdf (accessed August 1, 2019).
- Iannini, M. (2010). Marketing olfativo, un valor diferencial. *Mark. Ventas* 253, 58–64.
- InboundCycle, (2020). *Conceptos clave del inbound marketing*. Available online at: <https://www.inboundcycle.com/academia/diccionario-inbound-marketing> (accessed 10 of May 10, 2020).
- Inese, (2018). *La digitalización del sector seguros*. Available online at: <https://www.inese.es/la-digitalizacion-del-sector-seguros/> (accessed on 12 August 12, 2020).
- Instituto Nacional de Estadística [INE], (2018a). *Encuesta sobre el uso de TIC y comercio electrónico en las empresas*. Madrid: INE.
- Instituto Nacional de Estadística [INE], (2018b). *Encuesta sobre equipamiento y uso de tecnologías de información y comunicación en los hogares*. Madrid: INE.
- ISO (2019). *ISO/IEC 25010*. Available online at: <https://iso25000.com/index.php/normas-iso-25000/iso-25010> (accessed 1 March 1, 2019).
- ISO 9001:2015 (2016). *Desarrollo del concepto calidad. Escuela Europea de Excelencia*. Available online at: <https://www.nueva-iso-9001-2015.com/2016/09/desarrollo-concepto-calidad/> (accessed 1 March 1, 2019).
- It User (2018). *El estado de la transformación digital en España no es alentador*. Available online at: <https://tecnologiaparatuempresa.ituser.es/transformacion-digital/2018/04/el-estado-de-la-transformacion-digital-en-espana-no-es-alentador> (accessed February 10, 2020).
- IZO (2019). *Employee Experience*. Available online at: <https://asociaciondec.org/viernes-dec/employee-experience/37851/> (accessed May 10, 2020).
- Izquierdo-Yusta, A., Olarte-Pascual, C., and Reinares-Lara, E. (2015). Attitudes toward mobile advertising among users versus non-users of the mobile Internet. *Telemat. Inform.* 32, 355–366. doi: 10.1016/j.tele.2014.10.001
- Izquierdo Yusta, A., Martínez Ruiz, M. P., and Jiménez Zarco, A. I. (2011). *El Papel de la Conveniencia y de la Norma Subjetiva en la Intención de Compra por Internet (B2C): una aplicación en la industria hotelera*. Available online at: <https://www.redalyc.org/articulo.oa?id=94721305001httpwwwredalycorgarticuloaid94721305001ISSN18064892> (accessed March 2, 2019).
- Jiménez-Zarco, A. I., Rospigliosi, A., Martínez-Ruiz, M. P., and Izquierdo-Yusta, A. (2019). “Marketing 4.0: enhancing consumer-brand engagement through big data analysis,” in *Web Services: Concepts, Methodologies, Tools, and Applications*, (Hershey: IGI Global), 2172–2195. doi: 10.4018/978-1-5225-7501-6.ch113

- Karjaluoto, H., Jayawardhena, C., Leppäniemi, M., and Pihlström, M. (2012). How value and trust influence loyalty in wireless telecommunications industry. *Telecommunicat. Policy* 36, 636–649. doi: 10.1016/j.telpol.2012.04.012
- Kassim, N., and Asiah Abdullah, N. (2010). The effect of perceived service quality dimensions on customer satisfaction, trust, and loyalty in e-commerce settings: a cross cultural analysis. *Asia Pacific J. Mark. Logist.* 22, 351–371. doi: 10.1108/13555851011062269
- Klaus, P. (2013). The case of Amazon.com: towards a conceptual framework of online customer service experience (OCSE) using the emerging consensus technique (ECT). *J. Serv. Market.* 27, 443–457. doi: 10.1108/JSM-02-2012-0030
- Knutson, B., Stevens, P., Wullaert, C., Patton, M., and Yokoyama, F. (1990). Lodgerv: a service quality index for the lodging industry. *J. Hosp. Manag.* 14, 277–284. doi: 10.1177/109634809001400230
- Kobusińska, A., and Hsu, C. H. (2018). Towards increasing reliability of clouds environments with restful web services. *Fut. Generat. Comput. Syst.* 87, 502–513. doi: 10.1016/j.future.2017.10.050
- Kohli, A. K., Jaworski, B. J., and Shabshab, N. (2019). “Customer centrality: a multi-year journey,” in *Handbook on Customer Centrality*, (Cheltenham: Edward Elgar Publishing).
- Kristensson, P., Matthing, J., and Johansson, N. (2008). Key strategies for the successful involvement of customers in the co-creation of new technology-based services. *Int. J. Serv. Ind. Manag.* 19, 474–491. doi: 10.1108/09564230810891914
- Kujala, S., Mugge, R., and Miron-Shatz, T. (2017). The role of expectations in service evaluation: a longitudinal study of a proximity mobile payment service. *Int. J. Hum. Comput. Stud.* 98, 51–61. doi: 10.1016/j.ijhcs.2016.09.011
- La Vanguardia, (2019). El sector asegurador creció en 2018 y lo seguirá haciendo este año. Available online at: <https://www.lavanguardia.com/seguros/coches/20190128/462107228762/el-sector-asegurador-crecio-en-2018-y-lo-seguira-haciendo-este-ano.html> (accessed September 18, 2019).
- Lassala Navarré, C., Ruiz Mafé, C., and Sanz Blas, S. (2010). Implicaciones de la satisfacción, confianza y lealtad en el uso de los servicios bancarios online, un análisis aplicado al mercado español. *Revista Europea de Dirección y Economía de la Empresa* 19, 27–46.
- Lemon, K. N., and Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *J. Mark.* 80, 69–96. doi: 10.1509/jm.15.0420
- Liferay Inc. (2019). 5 desafíos de digitalización para el sector asegurador. Available online at: <https://revistabyte.es/actualidad-it/digitalizacion/> (accessed on August 12, 2020).
- Lin, C., and Lekhawipat, W. (2014). Factors affecting online repurchase intention. *Ind. Manag. Data Syst.* 114, 597–611. doi: 10.1108/IMDS-10-2013-0432
- Liu, C., and Arnett, K. (2000). Exploring the factors associated with web site success in the context of electronic commerce. *Inf. Manag.* 38, 23–33. doi: 10.1016/S0378-7206(00)00049-5
- Loiacono, E. T., Watson, R. T., and Goodhue, D. L. (2000). *Webqual: A Web Site Quality Instrument*. Athens, GA: University of Georgia.
- Long, M., and McMellon, C. (2004). Exploring the determinants of retail service quality on the internet. *J. Serv. Mark.* 18, 78–90. doi: 10.1108/08876040410520726
- Lourido Gómez, S., and Otero Neira, M. C. (2016). La dimensión afectiva de la experiencia de marca y el papel de las emociones en el comportamiento del consumidor. 26 Congreso ACEDE Vigo, ponencia 3592: [libro de actas].
- Madu, C. N., and Madu, A. A. (2002). Dimensions of e-quality. *Int. J. Qual. Reliab. Manag.* 19, 246–258. doi: 10.1108/02656710210415668
- Malhotra, N. K. (2008). *Investigación de Mercados*, 5th Edn. México: Pearson Educación.
- Mallaina García, Ó (2017). *La comunicación comercial en la distribución minorista y la nueva estrategia omnicanal*. Doctoral tesis, Universidad Complutense de Madrid, Madrid.
- Marketing Science Institute, (2016). *Research Priorities 2016-2018*. Available online at: <http://www.msi.org> (accessed 2 June 2, 2020).
- Martínez-Cañas, R., Ruiz-Palomino, P., Linuesa-Langreo, J., and Blázquez-Resino, J. J. (2016). Consumer participation in co-creation: an enlightening model of causes and effects based on ethical values and transcendent motives. *Front. Psychol.* 7:793. doi: 10.3389/fpsyg.2016.00793
- MDs, (2018). *Digital Customer Experience*. Available online at: <http://www.marketingdeservicios.com> (accessed August 5, 2019)
- Méndez Aparicio, M. D. (2019). *Determinantes y consecuencias de la Experiencia de Cliente y la Satisfacción en el ámbito digital: un análisis del uso de áreas privadas*. Doctoral tesis, Universidad de Burgos, Burgos.
- Méndez-Aparicio, M. D., Izquierdo-Yusta, A., and Jiménez-Zarco, A. I. (2017). Consumer expectations of online services in the insurance industry: an exploratory study of drivers and outcomes. *Front. Psychol.* 8:1254. doi: 10.3389/fpsyg.2017.01254
- Mendoza-Tello, J. C., Mora, H., Pujol-López, F. A., and Lytras, M. D. (2018). Social commerce as a driver to enhance trust and intention to use cryptocurrencies for electronic payments. *IEEE Access* 6, 50737–50751. doi: 10.1109/access.2018.2869359
- Meyer, M., and Harris, E. S. (2012). The consumer is king. *Economics* 14, 1–4.
- Michalco, J., Simonsen, J. G., and Hornbæk, K. (2015). An exploration of the relation between expectations and user experience. *Int. J. Hum. Comput. Interact.* 31, 603–617. doi: 10.1080/10447318.2015.1065696
- Minsait, Asociación para el Desarrollo de la experiencia de clientes-DEC, (2019). *Informe Minsait-DEC. Digitalización y Experiencia de Cliente*. Available online at: <https://asociaciondec.org/informes-dec/informe-digitalizacion-y-experiencia-de-cliente/38552/> (accessed 3 July 3, 2019).
- Molina, C. M., Moreno, M. R., González, B. P., and Moreno, R. R. (2017). *Estrategia omnicanal en la distribución de servicios públicos*. Reston, VA: INAP.
- Nakamura, J., and Csikszentmihalyi, M. (2014). “The concept of flow,” in *Flow and the Foundations of Positive Psychology*, ed. M. Csikszentmihalyi, (Chicago, IL: Springer), 239–263.
- Ngo, L. V., and O’Cass, A. (2013). Innovation and business success: The mediating role of customer participation. *J. Bus. Res.* 66, 1134–1142. doi: 10.1016/j.jbusres.2012.03.009
- Nicoletti, B. (2016). “Digital insurance throughout the world,” in *Digital Insurance*, (London: Palgrave Macmillan), 242–251. doi: 10.1057/9781137553270_8
- Noe, R. A., Hollenbeck, J. R., Gerhart, B., and Wright, P. M. (2017). *Human Resource Management: Gaining a Competitive Advantage*. New York, NY: McGraw-Hill Education.
- OECD, (2020). *Insurance Spending (Indicator)*. Available online at: <https://www.oecd.org/pensions/Technology-and-innovation-in-the-insurance-sector.pdf> (accessed April 9, 2020).
- Oghuma, A. P., Libaque-Saenz, C. F., Wong, S. F., and Chang, Y. (2016). An expectation-confirmation model of continuance intention to use mobile instant messaging. *Telemat. Informat.* 33, 34–47. doi: 10.1016/j.tele.2015.05.006
- Oh, H., Fiore, A. M., and Jeong, M. (2007). Measuring experience economy concepts: tourism applications. *J. Travel Res.* 46, 119–131. doi: 10.1177/0047287507304039
- Olarte-Pascual, C., Pelegrín-Borondo, J., and Reinares-Lara, E. (2016). Cognitive-affective model of acceptance of model phone advertising. *E+M Economía Manag.* 19, 134–148. doi: 10.15240/tul/001/2016-4-010
- Oliver, R. L. (2014). *Satisfaction: A Behavioral Perspective on the Consumer: A Behavioral Perspective on the Consumer*. London: Routledge.
- Oliver, R. L., and Burke, R. R. (1999). Expectation processes in satisfaction formation. *J. Serv. Res.* 1, 196–214. doi: 10.1177/109467059913002
- Palm, M. (2016). *Technologies of Consumer Labor: A History of Self-Service*. New York, NY: Routledge.
- Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *J. Market.* 49, 41–50. doi: 10.2307/1251430
- Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1994). Reassessment of expectations as a comparison standard in measuring service quality: implications for further research. *J. Market.* 58, 111–124. doi: 10.2307/1252255
- Pelegrín Borondo, J. (2013). *Análisis Comparativo de la Estrategia de los Grupos Competitivos: E-clientes vs. Clientes Off-Line*. Doctoral tesis, Universitat Rovira I Virgili, Tarragona.
- Pelegrín-Borondo, J., Arias-Oliva, M., and Olarte-Pascual, C. (2017). Emotions, price and quality expectations in hotel services. *J. Vacat. Mark.* 23, 322–338. doi: 10.1177/1356766716651305
- Pelegrín-Borondo, J., Juaneda Ayensa, E., Olarte-Pascual, C., and Sierra-Murillo, Y. (2016). Diez tipos de expectativas. *Rev. Perspect. Empresarial* 3, 109–124. doi: 10.16967/rpe.v3n1a7
- Peralta Montecinos, J. (2015). Rol de las expectativas en el juicio de satisfacción y calidad percibida del servicio. *Límite* 14, 195–214.

- Pérez-Rave, I. I., and Muñoz-Giraldo, L. (2014). Espacio literario relevante sobre la evaluación de la calidad del servicio: países de realización de los estudios, métodos de análisis, índices de fiabilidad, hipótesis y desafíos. *Elsevier, Ingeniería, Investigación y Tecnología* 15, 479–492. doi: 10.1016/S1405-7743(14)70356-7
- Pine, J., and Gilmore, J. (1999). *The Experience Economy*. Boston, MA: Harvard Business School Press.
- Pons, J. (2015). *Los clientes nos piden amor y nosotros les damos sexo. Efecto wow*. Available online at: <http://www.experienciadeciente.com/?tag=wow> (accessed August 16, 2019).
- Prado Román, A., Blanco González, A., and Mercado Idoeta, C. (2013). Satisfacción, lealtad y compromiso en entornos on-line. *Esic Mark. Econ. Bus. J.* 44, 167–189.
- PWC. (2017). *Top Insurance Industry Issues in 2017*. Available online at: <http://www.pwc.com/us/en/insurance/publications/assets/pwc-2017-insurance-top-issues.pdf> (accessed November 20, 2019).
- Raita, E., and Oulasvirta, A. (2011). Too good to be bad: Favorable product expectations boost subjective usability ratings. *Interact. Comput.* 23, 363–371. doi: 10.1016/j.intcom.2011.04.002
- Ramaswamy, V., and Chopra, N. (2014). Building a culture of co-creation at Mahindra. *Strategy Leadersh.* 42, 12–18. doi: 10.1108/sl-01-2014-0005
- Rather, R. A. (2020). Customer experience and engagement in tourism destinations: the experiential marketing perspective. *J. Travel Tour. Mark.* 37, 15–32. doi: 10.1080/10548408.2019.1686101
- Rather, R. A., and Camilleri, M. A. (2019). The effects of service quality and consumer-brand value congruity on hospitality brand loyalty. *Anatolia* 30, 547–559. doi: 10.1080/13032917.2019.1650289
- Real Academia Española, R. A. E. (2019). *Diccionario de la lengua española*. Available online at: <http://www.rae.es> (accessed November 1, 2019).
- Rey-García, M., Lirola-Walton, E., and Mato-Santiso, V. (2017). “La transformación digital de la distribución comercial: la tienda física, de caja brick and mortar a nodo omnicanal,” in *Marketing Insights: La Respuesta del Comercio a las Tendencias de Comportamiento Social del Consumidor*, eds J. A. Trespalacios Gutiérrez, R. Vázquez Casielles, E. Estrada Alonso, and C. González Mieres, (Oviedo: Cátedra Fundación Ramón Areces de Distribución Comercial, Universidad de Oviedo), 297–320.
- Ringle, C., Wende, S., and Becker, J. (2015). *SmartPLS 3. Boenningstedt: SmartPLS GmbH*. Available online at: <http://www.smartpls.com> (accessed May 5, 2019).
- Rodríguez del Bosque, I., and San Martín, H. (2008). Tourist satisfaction a cognitive-affective model. *Ann. Tour. Res.* 35, 551–573. doi: 10.1016/j.annals.2008.02.006
- Rodríguez Calvente, A. (2019). *Artículos sobre Transformación Digital*. Available online at: <https://www.paradigmadigital.com/tag/transformacion-digital/> (accessed February 10, 2020).
- Rodríguez-Ardura, I., Maraver-Tarifa, G., Jiménez-Zarco, A. I., Martínez-Argüelles, M. J., and Ammetler, G. (2018). *Principios y Estrategias de Marketing*, Vol. 2. Barcelona: Edi UOC.
- Romero, D., and Molina, A. (2011). Collaborative networked organisations and customer communities: value co-creation and co-innovation in the networking era. *Product. Plann. Control* 22, 447–472. doi: 10.1080/09537287.2010.536619
- Roy, S., Eshghi, A., and Sarkar, A. (2013). Antecedents and consequences of brand love. *J. Brand Manag.* 20, 325–332. doi: 10.1057/bm.2012.24
- San Martín Gutiérrez, H., Collado Agudo, J., Rodríguez, and del Bosque, I. (2008). El proceso global de satisfacción bajo múltiples estándares de comparación: el papel moderador de la familiaridad, la involucración y la interacción cliente-servicio. *Revista Española Investigación Marketing ESIC* 12, 65–95.
- Schmitt, B., Joško Brakus, J., and Zarantonello, L. (2015). From experiential psychology to consumer experience. *J. Consum. Psychol.* 25, 166–171. doi: 10.1016/j.jcps.2014.09.001
- Shao, W., Grace, D., and Ross, M. (2019). Investigating brand visibility in luxury consumption. *J. Retail. Consum. Serv.* 49, 357–370. doi: 10.1016/j.jretconser.2019.04.017
- Sierra Díez, B., Froufe Torres, M., and Falces Delgado, C. (2010). El papel de las metas conscientes e inconscientes en la motivación del consumidor. *REME* 13, 193–210.
- Skålén, P., Gummerus, J., Von Koskull, C., and Magnusson, P. R. (2015). Exploring value propositions and service innovation: a service-dominant logic study. *J. Acad. Mark. Sci.* 43, 137–158. doi: 10.1007/s11747-013-0365-2
- Strong View. (2014). *Brand Loyalty Survey*. Available online at: http://media.strongview.com/images/StrongView_Brand_Survey_Infographic.pdf (accessed August 11, 2019).
- Suarez Álvarez, L., Vázquez Casielles, R., and Martín, A. M. D. (2007). La confianza y la satisfacción del cliente: variables clave en el sector turístico. *Revista Europea de Dirección y Economía de la Empresa* 16, 115–132.
- Swaide, S. I., and Wigand, R. T. (2012). The effect of perceived site-to-store service quality on perceived value and loyalty intentions in multichannel retailing. *Int. J. Manag.* 29, 301–313.
- Tamborini, R., Grizzard, M., Bowman, N. D., Reinecke, L., Lewis, R. J., and Eden, A. (2011). Media enjoyment as need satisfaction: The contribution of hedonic and non hedonic needs. *J. Commun.* 61, 1025–1042. doi: 10.1111/j.1460-2466.2011.01593.x
- Thakur, R., and Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. *Internet Res.* 24, 369–392. doi: 10.1108/intr-12-2012-0244
- Tokman, M., Davis, L. M., and Lemon, K. N. (2007). The WOW factor: creating value through win-back offers to reacquire lost customers. *J. Retail.* 83, 47–64. doi: 10.1016/j.jretai.2006.10.005
- Triantafyllidou, A., and Siomkos, G. (2014). Consumption experience outcomes: satisfaction, nostalgia intensity, word-of-mouth communication and behavioural intentions. *J. Consum. Mark.* 31, 526–540. doi: 10.1108/JCM-05-2014-0982
- Tsai, W. H., Hsu, W., and Chou, W. C. (2011). A gap analysis model for improving airport service quality. *Total Q. Manag.* 22, 1025–1040. doi: 10.1080/14783363.2011.611326
- Vargo, S. L., and Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *J. Acad. Mark. Sci.* 36, 1–10. doi: 10.1007/s11747-007-0069-6
- Vargo, S. L., and Lusch, R. F. (2014). Inversions of service-dominant logic. *Marketing Theory* 14, 239–248. doi: 10.1177/1470593114534339
- Venkatesh, V., Thong, J. Y., and Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Q.* 36, 157–178. doi: 10.2307/41410412
- Wai, K., Dastane, O., Johari, Z., and Ismail, N. B. (2019). Perceived risk factors affecting consumers' online shopping behaviour. *J. Asian Finance Econ. Bus.* 6, 246–260. doi: 10.13106/jafeb.2019.vol6.no4.249
- Waite, K., and Harrison, T. (2002). Consumer expectations of online information provided by bank Web sites. *J. Financ. Serv. Market.* 6, 309–322. doi: 10.1057/palgrave.fsm.4770061
- Walls, A. R., Okumus, F., Wang, Y., and Kwun, D. J. W. (2011). An epistemological view of consumer experience. *Int. J. Hospital. Manag.* 30, 10–21. doi: 10.1016/j.ijhm.2010.03.008
- Wang, X. (2011). The effect of unrelated supporting service quality on consumer delight, satisfaction, and repurchase intentions. *J. Serv. Res.* 14, 149–163. doi: 10.1177/1094670511400722
- Wang, Y., So, K. K. F., and Sparks, B. A. (2016). Technology readiness and customer satisfaction with travel technologies: a cross-country investigation. *J. Travel Res.* 56, 563–577. doi: 10.1177/0047287516657891
- Wanick, V., Mataruna-Dos-Santos, L. J., and Guimarães-Mataruna, A. F. (2017). *The role of video-games in mega-events: footprints connections. Mega Events Footprints: Past, Present and Future*. Rio de Janeiro: Engenho. 301–319.
- Warren, H. C. (2018). *Dictionary of Psychology*. New York, NY: Routledge.
- Wolfenbarger, M., and Gilly, M. C. (2002). *comQ: Dimensionalizing, Measuring and Predicting Quality of the E-Tail Experience*. Cambridge, MA: Marketing Science Institute.
- Worchel, S., Cooper, J., Goethals, G. R., and Olson, J. M. (2003). *Psicología Social*. Madrid: Thomson.
- Yang, Z., and Jun, M. (2002). Consumer perception of e-Service quality: from internet purchaser and non-purchaser perspectives. *J. Bus. Strategy* 19, 19–41.
- Yang, Z., Jun, M., and Peterson, R. (2004). Measuring customer perceived online service quality: scale development and managerial implications. *Int. J. Oper. Prod. Manag.* 24, 1149–1174. doi: 10.1108/01443570410563278

- Yoo, B., and Donthu, N. (2001). Developing a scale to measure the perceived quality of internet shopping sites (SITEQUAL). *Q. J. Electron. Commer.* 2, 31–45. doi: 10.1007/978-3-319-11885-7_129
- Yoo, C. W., Sanders, G. L., and Moon, J. (2013). Exploring the effect of e-WOM participation on e-Loyalty in e-commerce. *Decis. Support Syst.* 55, 669–678. doi: 10.1016/j.dss.2013.02.001
- Zavareh, F. B., Ariff, M. S. M., Jusoh, A., Zakuan, N., Bahari, A. Z., and Ashourian, M. (2012). e-service quality dimensions and their effects on e-customer satisfaction in internet banking services. *Procedia Soc. Behav. Sci.* 40, 441–445. doi: 10.1016/j.sbspro.2012.03.213
- Zehrer, A., and Raich, F. (2016). The impact of perceived crowding on customer satisfaction. *J. Hosp. Tour. Manag.* 29, 88–98. doi: 10.1016/j.jhtm.2016.06.007
- Zeithaml, V. A., and Bitner, M. J. (2000). “Services marketing,” in *Integrating Customer Focus Across the Firm* (New York, NY: Irwin McGraw-Hill).
- Zeithaml, V. A., and Bitner, M. J. (2002). *Marketing de Servicios. Un enfoque integrador de del cliente a la empresa*. México: McGraw-Hill.
- Zhu, G., and Gao, X. (2019). Precision retail marketing strategy based on digital marketing model. *Sci. J. Bus. Manag.* 7, 33–37. doi: 10.11648/j.sjbm.20190701.15

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Cooperation With Universities in the Development of Eco-Innovations and Firms' Performance

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In recent decades, the expansion of economic activity has been accompanied by negative environmental impacts. In response, there have been dramatic changes worldwide in terms of an increased demand for environmentally friendly products and services. To achieve these eco-innovations, firms have sought to acquire knowledge and implement operational flexibility by cooperating with different agents such as universities through a value cocreation system that is also expected to enhance firms' performance. Using a sample of 250 companies, the present paper examines the role of cooperation with universities in the development of diverse environmental innovations and building operational flexibility and, through this, improving firm performance. Results show that firms that value cooperation with universities develop a wider range of environmental innovations and increase their sales and benefits.

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INTRODUCTION

During the last few decades, the development of the internet and data analysis (Geczy et al., 2014), the abundance of available information (Southwell, 2005), globalization (Mark, 1996), and increased consumer power (Kucuk, 2008), or what is known as the sharing economy (Belk, 2018), have brought about dramatic changes that affect people and organizations (Sobrinho et al., 2019), as well as have negative environmental impacts. In response, environmental issues have become a top priority for governments, which, through regulations and fiscal incentives, among others, have been promoting "eco-innovations" (OECD, 2009). These innovations seek to reduce pollution and other negative impacts of economic and business activities on the environment (Kemp and Pearson, 2007).

Moreover, because of increased consumer power and awareness of environmental concerns, consumers are increasingly willing to pay for products or services produced in a more environmentally conscious way (McDonagh and Prothero, 2014). Thus, there is a market pull toward environmental innovations, providing a means for firms to improve their competitive advantage.

However, because most firms lack sufficient knowledge to respond to these expectations on their own, they must cooperate with different agents; as a result, their image extends beyond a traditional image of a supplier that produces goods and services to be offered to customers, to a value cocreation system in which participants integrate their resources and competencies to increase the creation of value in a service system (Vargo et al., 2008; González-Torres et al., 2020).

In the last two decades, the number of theoretical and empirical contributions to the development of eco-innovations has been increasing (González-Moreno et al., 2019).

Additionally, since the seminal work of Prahalad and Ramaswamy (2000) and the proposal of a service-dominant logic by Vargo and Lusch (2004), many authors have worked in the field of value cocreation, giving rise to an abundant, and varied literature that stems from overcoming a linear vision of value chains and value creation (González-Torres et al., 2020).

In this sense, eco-innovation and value cocreation are increasingly considered potential strategies to enhance the firm's competitiveness in international markets and are thus attracting interest from both industry and academia. The role of firm's cooperation with universities in the development of innovations has been previously studied (Bayona et al., 2001; Lutchen, 2018). Additionally, the literature has highlighted the importance of cooperation in the development of environmental innovations (De Marchi, 2012; Albort-Morant et al., 2018; Tumelero et al., 2019). However, the role of cooperation with universities and research institutions as a way to generate environmental innovations is still underestimated (Díaz-García et al., 2015) and its potential to promote firm performance has not been explored in depth (Mascarenhas et al., 2018). Recently, Jové-Llopis and Segarra-Blasco (2018) studied the relationship between eco-innovation strategies and firm performance in terms of sales growth in a large sample of European small and medium-sized enterprises (SMEs) but did not consider the effect of cooperation. The main goal of this article is to fill this gap by providing an analysis of the effect of cooperation with universities to achieve eco-innovation and enterprise results. We also include operational flexibility in the analysis as a capability that could enhance firms' performance and be increased by cooperation with universities and research institutions.

The rest of this article is organized as follows. The next section provides a theoretical overview of the topic. Then, we present the methodology, followed by the results and discussion. Finally, the conclusions section presents the limitations and future research directions.

THEORETICAL FRAMEWORK

Eco-Innovation and Firm Performance

In recent decades, the global economic environment has been characterized by the world has been facing a new environment characterized by its volatility, uncertainty, complexity, and ambiguity (Whiteman, 1998), which has resulted from the expansion of economic activity among other factors and been accompanied by environmental concerns such as climate change, energy security, and the increasing scarcity of resources (OECD, 2009). Hence, sustainability has been a top priority for governments, and many have adopted long-term frameworks to tackle these concerns (OECD, 2009).

In addition, new generations have a greater awareness of such environmental problems, and consumers are willing to pay a higher price for products or services produced in a more environmentally friendly way (McDonagh and Prothero, 2014). Therefore, the expectations for greater industry efforts to achieve sustainable development have been increasing,

and the sustainable manufacturing of new products and services in an environmentally friendly manner has been at the heart of industry policy and practices this century (Triguero and González-Moreno, 2019).

In this sense, stakeholders recognize that sustainable manufacturing has become a key to improving financial results at the firm level, given that environmental concerns drive the generation of competitive advantages (Díaz-García et al., 2015). Hence, firms need to innovate in order to be more efficient and focus on the development of new products or processes that are environmentally friendly; this is known as "eco-innovation" and can be defined as: *"The production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organization (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives"* (Kemp and Pearson, 2007, p. 8).

As mentioned above, eco-innovation, which is also known as "green innovation" and "environmental innovation," has become a market pull owing to consumer demand for greener products and services (Kesidou and Demirel, 2012).

The use of cleaner technologies reduces the likelihood of costs associated with environmental risks (Shrivastava, 1995) and may also contribute to the reduction of manufacturing costs (Christmann, 2000). Moreover, because environmental concerns have been a top priority for governments, regulations, and fiscal incentives have been used as effective drivers of eco-innovation to enable firms to implement environmental regulations that improve their performance (Triguero et al., 2013). Additionally, eco-innovation can lead to the improvement of a firm's reputation (Moreno-Mondéjar et al., 2020) for being environmentally sound, which may enhance its reputation for quality.

Literature has demonstrated how eco-products (Kammerer, 2009), eco-processes (Hojnik and Ruzzier, 2016), and recycling of waste or materials (Doran and Ryan, 2016) positively and separately influence firms' performance. Additionally, recent empirical evidence also suggests that the existence of complementarity between different types of eco-innovations and that this increases firm performance (Moreno-Mondéjar et al., 2020). Firms that implement two or more types of complementary eco-innovations will obtain better results than those applying only one of them (Cainelli et al., 2011) because there might be interdependence between, for example, product and process eco-innovation (Cheng et al., 2014).

Therefore, it is possible to expect a positive relationship between the diversity of eco-innovation strategies and firm performance. Formally, we propose that:

Hypothesis 1: The implementation of a variety of eco-innovations positively influences firm performance.

Cooperation With Universities and Performance

In accordance with the discussion above, it is crucial to be aware that in order to adopt eco-innovations or, indeed, any kind of innovation, technology-push drivers are decisive in explaining

these adoptions; therefore, eco-innovations depend on a firms' technological capabilities, which determine the probability of eco-innovation (Horbach et al., 2013).

Additionally, it is considered that research and development (R and D) increases the degree of innovativeness of a firm with regard to eco-innovations (Tumelero et al., 2019). However, most firms lack resources to invest in internal R and D and, in this sense, most of them do not have the necessary knowledge to eco-innovate on their own. Hence, to innovate beyond their own limits, firms need to establish alliances with external agents such as suppliers, clients, and research centers, in order to develop their capability for innovation (De Marchi, 2012; Albort-Morant et al., 2018; González-Moreno et al., 2019).

Thus, such cooperation with external agents enables firms to evolve from a traditional supplier that produces goods and services to be offered to customers to a value cocreation system in which participants integrate their resources and competencies to increase the creation of value in a service system (Vargo et al., 2008; González-Torres et al., 2020).

Therefore, association with other agents has turned to innovation (Sobrinho et al., 2019), challenging traditional concepts by encouraging firms to break with conventions and existing thought patterns through open innovation in which companies integrate both internal and external knowledge flow. This motivates internal innovation as well as enabling firms to seek out external channels in order to commercialize outcomes with the core idea of integrating knowledge, skills, and ideas from the public (Chesbrough, 2003a,b).

In this sense, universities, as institutional sources specializing in basic research, are one of the main key partners in enhancing eco-innovations (Cainelli et al., 2012). In the last few decades, there has been an explosion in the number of research agreements between firms and universities, facilitating, on one hand, the ability of firms to enhance their own research performance by providing them access to the best scientific and engineering minds, turning them into essential allies in R and D (Lutchen, 2018).

On the other hand, universities have also been receptive to these research alliances because of the challenges in obtaining government support for academic research and, at the same time, because of new academic demands that force them to extend their traditional missions of teaching and research to a third mission that calls on them to contribute more to their local economies more effectively through cooperation with industry (Giuliani and Arza, 2009; Lutchen, 2018).

Universities and research centers have thus turned into essential partners for firms that wish to gain new knowledge for innovation. Universities are involved in scientific production and make a 2-fold contribution to innovation: introducing knowledge and technological staff to increase skills and provide ideas through research that may prove crucial to industry and the innovation process (Bayona-Sáez et al., 2001).

Therefore, universities and research centers are important agents in efforts to achieve eco-innovation because of their crucial role in the innovation system and ability to offer firms basic knowledge. Furthermore, they are a key agent for eco-innovations because, through alliances, both firms and

universities may be able to obtain more funds to conduct research projects; such cooperative relationships make it easier to participate in programs for the promotion of innovation, financed by various administrative bodies (Bayona-Sáez et al., 2001). Hence, both universities and industry, through cooperation, will be able to cocreate value and, because of the sum of the inflow and outflow of this knowledge, develop environmental innovations. Formally, we propose that:

Hypothesis 2: Cooperation with universities positively influences the development of eco-innovations.

Flexibility is a strategy to cope with dynamic environments (Gerwin, 1993). The strategic effectiveness of an organization depends on the compatibility of structures and processes within the firm and within the environment in which it operates. Thus, firms should use different strategies to cope with turbulence through operational flexibility, which is understood as the organization's ability to meet an increasing variety of customer expectations while keeping costs, delays, organizational disruptions, and performance losses at or near zero (Zhang et al., 2002). In this sense, operational flexibility includes the ability to make rapid, low-cost changeovers, adjust capacity incrementally, and quickly launch products with incremental changes within certain parameters in response to market needs.

However, most firms do not have the necessary capabilities to cope on their own with these dynamic environments, where eco-innovations, among other innovations, require that firms to extend their traditional systems and develop strategies that provide the right kind of flexibility to succeed (Moreno-Mondéjar et al., 2020). As a result, most firms need to outsource crucial components and forge supply chain partnerships with other agents (Anand and Ward, 2004). In this sense, cooperation with universities is crucial for operational flexibility, because knowledge acquisition through these alliances empowers the value chain, enabling firms to specialize in their core business by leaving research, which is not their main strength, to the universities and research centers that are experts in that field (González-Torres et al., 2020).

Therefore, through cooperation with universities, firms may be capable of making rapid changes in product design to a wide range of products, because this cooperation would help them to expand their services to meet an increasing variety of customer expectations (Zhang et al., 2002). Hence, it would be possible to propose, as a third hypothesis, that:

Hypothesis 3: Cooperation with universities increases the operational flexibility of firms.

Firms require to have enough capabilities and knowledge to respond and develop solutions to current dynamic environment demands. Therefore, cooperation with universities has turned crucial to enabling firms to acquire basic knowledge and competitive research, to respond to these new demands, as well as to gain access to networks and at the same time to increase their reputation and thus improve their position in the market (Bayona et al., 2001).

Furthermore, cooperation with universities has turned in an opportunity for firms to obtain funding for research projects, run by administrative bodies, and on another hand, has also turned in an opportunity to carry out a long-term technological strategy, in order to make the most of the opportunities offered to them by the public R and D system (Bayona et al., 2001).

Hence, considering that cooperation with universities and research institutions will increase firm's operational flexibility and the development of eco-innovations and that we expect a positive relationship between the variety of eco-innovations and firm's performance, and we could propose a direct and indirect effect of cooperation with universities and performance. Cooperation with universities will increase firm's knowledge base as well firm's image and reputation (Bayona et al., 2001). This reputation will also improve for being environmentally sound and develop eco-innovations (Moreno-Mondéjar et al., 2020). Therefore, we can propose that:

Hypothesis 4: Cooperation with universities increases firm performance.

Operational Flexibility and Performance

As already mentioned, increasing global competition, the acceleration of technological changes and expanding customer expectations create a turbulent environment; in response, firms are forced to increase their flexibility to meet the increasing variety of customer expectations. Therefore, the operational flexibility of firms plays an important role in effectively achieving a competitive advantage, because it enables firms to respond, in a rapid and cost-effective manner, to specific customer requests (Carlsson, 1989; Gerwin, 1993).

There is an increasing demand for environmentally friendly products and services. In this sense, through operational flexibility, firms may be able to foster changes in product or processes that may conduce to augmenting their chances to reduce the consumption of inputs such as energy or raw materials, developing environmentally-friendly innovations, and contributing to lessen the environmental damage of the firm's activity (González-Moreno et al., 2019).

Furthermore, since the adoption of eco-innovations depends on firms' technological resources and capabilities, firms seek for cooperation with partners to reduce uncertainty and share the risks related to eco-innovations (Triguero et al., 2018). Then, operational flexibility turns crucial to enhance eco-innovations, and recent empirical research shows the role of operational flexibility in the development of biofuel technologies and other eco-innovations (Kou and Zhao, 2013). Hence, we can propose that:

Hypothesis 5: Operational flexibility positively drives eco-innovation.

In this sense, operational flexibility allows firms to respond rapidly to changing customer demands with new innovative products and modifications to existing products. Recognizing how industry evolves is a key capability that is positively associated with firm's performance (Fawcett et al., 1996) and previous research has examined the direct effect of flexibility

on performance through reduction of environmental uncertainty (Alpkan et al., 2007).

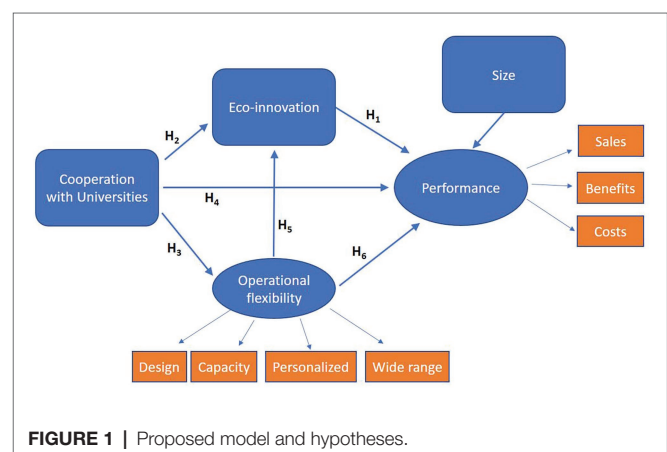
In addition, operational flexibility may help firms to provide a smooth flow of materials to the manufacturing process and quick delivery to customers. Furthermore, firms are also able to ensure that different groups, from both inside and outside of the organization, may easily coordinate product design, production, and distribution and, thus, take actions quickly to increase value to customers (Zhang et al., 2002).

Because of such operational flexibility, firms can increase the range of products available, offering more personalized products and services and making rapid changes to product design to quickly adjust their manufacturing capacity (Davis, 1993) and therefore achieving high performance. Consequently, because firms, through operational flexibility, can respond quickly to customer needs with high-quality products, innovative designs, and excellent after-sales services, they can build customer loyalty and thus increase market share to ultimately make large profits (Ferdows and De Meyer, 1990; Flynn and Flynn, 1996). We propose that:

Hypothesis 6: Operational flexibility positively drives firms' performance.

Figure 1 shows the model and the proposed hypotheses to be compared. We propose that cooperation with universities increases firms' operational flexibility (H3), thus enhancing firms' capacity to make rapid changes in product design, to rapidly adjust production capacity, to offer personalized products, and to develop a wide range of products – and, through these increased capabilities – enhances firm performance (H6).

Additionally, cooperation with universities helps firms to cocreate environmental innovations that enable them to reduce the environmental harms caused by their activities (H2). Eco-innovations will also be fostered by operational flexibility (H5). These eco-innovations improve firms' performance by fostering customer loyalty and even reducing manufacturing costs due to energy and resource consumption. Furthermore, a large variety of eco-innovations will also increase firms' performance owing to the existence of complementarities between different types of eco-innovations (H1).



Finally, we also expect a direct effect of cooperation with universities and firm performance (H4) and this cooperation will increase the firm's knowledge base and its reputation.

In our model, we have also included the size of the firm as a control variable. The model demonstrates how we measure performance and operational flexibility. **Table 1** gives additional information on variable definition.

MATERIALS AND METHODS

In order to test our model, we will focus on a particular industry, i.e., the food and beverage industry in Spain. This industry is in the manufacturing sector and accounts for the highest proportion of employment and economic output, both in Spain and in the European Union (Rabadán et al., 2019). The empirical analysis is based on an *ad hoc* survey. **Table 1** shows variable definition and descriptive statistics. Questionnaires were distributed in June 2017 to a randomly chosen sample of firms operating in the food and beverage Industry (NACE codes 10 and 11). From a random sample of 1,000 firms, 279 responded to the survey, which represents a 27.9% response rate. Considering the worst possible situation ($p = q = 0.5$) for a 95% CI, our margin of error is $\pm 5.84\%$. Finally, 29 cases were eliminated because of omitted data, and our final sample consisted of 250 firms.

In order to test our model and hypotheses, we use EQS software for structural equation modeling (SEM). SEM is a collection of statistical techniques that allows a set of relationships between one or more independent variables and one or more dependent variables to be examined. Both independent and dependent variables can be either continuous or discrete and can be either factors or measured variables (Bentler, 2006). SEM is a general term that covers a variety of statistical models and there are two major approaches to structural equation:

covariance-based and variance-based SEM. EQS uses covariance-based SEM, which is the more widely used approach (Astrachan et al., 2014). In this sense, Partial Least Square (PLS) is a variance-based SEM also useful and increasingly applied approach. PLS-SEM has become very popular among social science researchers due to its ability to handle small sample sizes, complex models, and non-normal data distributions (Ringle et al., 2020). Both approaches differ in their basic assumptions and outcomes as well as in their estimation procedures. EQS follows a maximum likelihood estimation procedure, while PLS uses a regression-based ordinary least squares estimation method. However, both try to analyze the cause-effect relations between variables.

As shown in **Figure 1**, our model comprises two latent variables: performance and operational flexibility. These variables are constructed through three and four items, respectively, and based on extensive literature. Similar subjective performance measures were previously used in Gupta and Govindarajan (1984) and Zhang et al. (2014), among others. Additionally, our operational flexibility variables are based on Anand and Ward (2004).

Table 1 shows the definition of the variables and descriptive statistics.

RESULTS AND DISCUSSION

For testing our model and hypotheses, we used EQS software for SEM. Regarding the goodness of fit of the model, the chi-square is 57.671 with a value of p 0.002 and 29 degrees of freedom. The results of the chi-square test were nearly always significant, implying a poor fit of the model to the data, but provided a basis for comparison. Anyway, other measures should be provided (Byrne, 2013). Therefore, we provide other goodness-of-fit tests that indicate that our model fits the data.

TABLE 1 | Definition of variables and descriptive statistics.

Variable	Description	Mean	SD	Min	Max
Sales	By how much have your sales increased in the last 3 years compared to your competitors (Likert scale) α	3.34	0.71	1	5
Benefits	By how much have your benefits increased in the last 3 years compared to your competitors (Likert scale) α	3.29	0.68	1	5
Costs	By how much have your costs reduced in the last 3 years compared to your competitors (Likert scale) α	3.20	0.74	1	5
Size	Number of employees	133.7	174.4	1	817
Eco-innovations	How many of the following five types of environmental innovation has your company introduced in the last 3 years: eco-product, eco-process, eco-packaging, more ecological distribution channel, and recycling of residuals	1.08	1.07	0	5
Cooperation with Universities	How important is it for your company to cooperate with universities and research institutions for the development of eco-innovations (Likert scale) β	0.49	1.61	0	5
Product design	Firm capacity to make rapid changes in product design (Likert scale) μ	3.73	1.30	1	5
Production capacity	Firm capacity to rapidly adjust production capacity (Likert scale) μ	4.00	1.15	1	5
Personalized products	Firm capacity to offer personalized products (Likert scale) μ	3.80	1.28	1	5
Wide range of products	Firm capacity to offer a wide range of products (Likert scale) μ	3.84	1.27	1	5

α Takes the value 1 if on the lower 20%; 2 if below average; 3 on average; 4 over average; and 5 on the top 20%.

β Takes the value 0 if no importance/cooperation; 1 if very low importance; 2 if low importance; 3 neutral; 4 if important; and 5 if very important.

μ Takes the value 1 if very low capacity; 2 low capacity; 3 neutral; 4 high capacity; and 5 very high capacity.

The X^2/df ratio is 1.98, below 2.0 (Tabachnick and Fidell, 2007). The CFI (Comparative Fit Index) is 0.982 and NNFI (Bentler-Bonett Non-normed Fit Index) is 0.972, both higher than 0.95, which indicates a good fit (Hu and Bentler, 1999). In addition, the RMSEA (Root Mean Square Error of Approximation) is 0.063, below 0.08, indicating an adequate fit (Browne and Cudeck, 1993). Therefore, considering the values of the global indicators, the overall fit of the model is acceptable.

Concerning our latent variables (performance and operational flexibility), both are explained, and all expected relationships are significant (see **Table 2** and **Figure 2**). Increase in sales (coefficient 0.885) and benefits (coefficient 0.955), and reductions in costs (coefficient 0.781) are the elements that define performance. Similarly, offering a wide range of products (coefficient 0.921) and a capacity to offer personalized products (coefficient 0.935) as well as to make rapid changes in product design (coefficient 0.915) and to rapidly adjust the production capacity (coefficient 0.817) give the firm operational capability. Cronbach alpha of performance (three items) and operational flexibility (four items) are 0.905 and 0.942, respectively. Additionally, **Table 2** shows the total effect of the variables as well as its decomposition in direct and indirect effect.

Our first hypothesis is corroborated. As seen in **Figure 2**, there is a positive and significant relationship between the diversity of eco-innovations and firms' performance (coefficient 0.213). Firms that develop a variety of eco-innovations, including eco-products, eco-process, more ecological distribution channels, and eco-packaging and recycling, obtain better results than those focused on a particular type of environmental innovation. Complementarities between the different kinds of eco-innovations would explain this result. Our finding is consistent with recent literature. Cheng et al. (2014) found that eco-product and eco-process innovations complement each other, influencing firm performance. Recently, Moreno-Mondéjar et al. (2020) found that the diversity of eco-innovations was positively associated with firms' sales growth.

Additionally, cooperation with universities has a significant and positive direct effect to the development of environmental innovations (coefficient 0.244). The greater the importance the firm places on cooperation with this particular agent, the wider the range of eco-innovations the firm develops. Therefore, our second hypothesis is supported, and we can conclude that value cocreation with universities leads to the development of eco-innovations. This finding is consistent with the argument that university-firm interaction, as well as knowledge collaboration with other non-business agents, increases firm's capacity for environmental innovation (Dangelico et al., 2013; Jones and Zubielqui, 2017).

Our third hypothesis is not supported, because no significant relationship is found between cooperation with universities and operational flexibility. We expected that through cooperation with universities firms would acquire knowledge to make them able of making rapid changes in product design to a wide range of products and to meet an increasing variety of customer expectations. However, universities and research institutions do not seem to be a clear knowledge source for this particular capability.

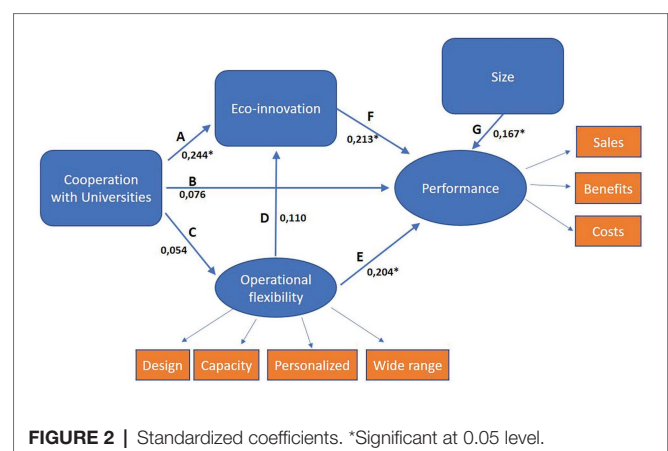


TABLE 2 | Decomposition of the parameters of the model.

Pathways between variables	Total effect	Partial indirect effect	Total indirect effect	Direct effect	R-squared
Product design → Oper. Flex.	0.915 (18.713)*	-	-	0.915 (18.713)*	0.838
Production capacity → Oper. Flex.	0.817 (15.561)*	-	-	0.817 (15.561)*	0.668
Personalized products → Oper. Flex.	0.935 (19.409)*	-	-	0.935 (19.409)*	0.874
Wide range products → Oper. Flex.	0.921 (18.909)*	-	-	0.921 (18.909)*	0.848
Sales → Perform	0.885 (15.768)*	-	-	0.885 (15.768)*	0.783
Benefits → Perform	0.955 (16.446)*	-	-	0.955 (16.446)*	0.912
Costs → Perform	0.781 (15.985)*	-	-	0.781 (15.985)*	0.611
CoopUniv → Oper. Flex.	0.054 (0.826)	-	-	0.054 (0.826) (C)	0.003
CoopUniv → Eco-innov	0.250 (4.066)*	CxD = 0.006	0.006 (0.748)	0.244 (3.989)* (A)	0.074
Oper. Flex. → Eco-innov	0.110 (1.744)	-	-	0.110 (1.744) (D)	
		AxF = 0.051			
CoopUniv → Perform	0.140 (2.176)*	CxE = 0.012	0.064 (2.527)*	0.076 (1.202) (B)	0.141
		CxDxF = 0.001			
Oper. Flex. → Perform	0.227 (3.451)*	DxF = 0.023	0.023 (1.550)	0.204 (3.160)* (E)	
Eco-innov → Perform	0.213 (3.314)*	-	-	0.213 (3.314)* (F)	
Size → Perform	0.167 (2.711)*	-	-	0.167 (2.711)* (G)	

Standardized parameter (t-value). The letters A, B, C, D, E, F, and G correspond to the notation in Figure 2. *Significant at 0.05 level.

Contrary to our expectations, we found no direct significant effect of cooperation with universities and performance. Hence, we cannot corroborate our fourth hypothesis. Similarly, no significant relationship was found of operational flexibility on eco-innovation. Then our fifth hypothesis is not supported.

On the contrary, operational flexibility positive and significantly affects performance (coefficient 0.204). Hence, our sixth hypothesis is corroborated, and we can state that the greater the firm's capacity to make rapid changes in product design, rapidly adjust its production capacity, and offer a wide range of personalized products, the greater its performance, as measured in terms of increase in sales and benefits and/or cost reductions. This is particularly important in the food and beverage industry, because it allows firms to rapidly adjust to changes in consumer demands (Avermaete et al., 2004).

Operational flexibility reflects the firm's capacity to face and respond to market dynamism and refers to having "built-in procedures which permit a high degree of variation in sequencing, scheduling, etc." (Carlsson, 1989, p. 186). Hence, this capability would help firms to reduce environmental uncertainty (Alpkan et al., 2007). Operational flexibility allows firms to have the necessary flexibility to change production volumes and diversify product features to meet customer demand, thus enhancing performance (Zhang et al., 2014).

In regard to our control variable, we found a positive and significant effect (coefficient 0.167) on performance. Our findings are similar to those of previous literature (Navaretti et al., 2014; Jové-Llopis and Segarra-Blasco, 2018; Moreno-Mondéjar et al., 2020) that highlight the importance of company size on the association between eco-innovation and firm performance. Size is associated with firms' resources and capabilities that enable them to develop the necessary knowledge base to promote eco-innovations (Segarra-Oña et al., 2013). The connection of company size with profitability is mainly based on the existence of economies of scale and/or market power (Fernández et al., 2019).

To summarize, firm performance is explained by cooperation with universities, eco-innovation, operational flexibility, and firm size. Although the explanatory power is not very high, we can partially explain firm performance based on these four variables ($R^2 = 14.2\%$). In addition, this eco-innovative behavior significantly depends on firms' cooperation with universities and operational flexibility ($R^2 = 7.4\%$). **Table 2** also shows the decomposition of the parameters of the model. It shows the total effect of the pathways between the variables as well as its direct, total indirect, and partial indirect effect. Particularly, it shows that, although there is no direct and significant effect of cooperation with universities on performance, there is a significant indirect effect (coefficient 0.064). Hence, the total effect is positive and significant (coefficient 0.140). The effect of cooperation with universities on performances is mainly mediated by eco-innovation.

Additionally, and as we have already mentioned, a firm's performance is also influenced by its operational flexibility (coefficient 0.205, significant at 95%) and by its size (coefficient 0.177, significant at 95%).

CONCLUSION

In this paper, we examine how cooperating with universities and research institutions may foster the development of value-added environmental innovations that improve firms' performance. In doing so, we develop a model of the relationships between cooperation with universities, operational flexibility, eco-innovation, and firm performance. We test the model, using SEM, on a sample of 250 firms operating in the Spanish food and beverage industry.

Our findings show that firms that value their cooperation with universities develop a wider variety of environmental innovations and, through this, increase their performance. Eco-innovations are usually developed with different objectives, such as production efficiency or meeting environmental standards, in mind. This multi-purpose nature of goals may require knowledge from different sources. Cooperating with universities and research institutions helps firms to gather this knowledge. Previous literature argues that eco-innovative activities necessitate more external knowledge sources than other innovations (Horbach et al., 2013). Additionally, in regard to the effect on performance, our results are consistent with Cainelli et al. (2011) who found complementarity between eco-product and eco-process innovations. Similarly, Cheng et al. (2014) found that the best performers implemented more than one type of green practice.

These results have several implications for practitioners and policy makers. The former should be aware of the complementarities between different types of eco-innovative activities and how they may increase firm sales and reduce costs. Also, the wider the variety of environmental activities developed by the firm, the greater the benefits. Additionally, universities and research institutions are ideal partners for gathering the necessary external knowledge to develop this particular type of innovation. Administrators and policy makers should note that policies that foster cooperation with universities and research institutions will be more effective in achieving the goal of reducing corporate environmental harms.

Finally, several limitations of this paper should be acknowledged and taken into account when generalizing the results. The main limitation arises from the fact that our sample is country-specific and limited to a single industry. Future research should apply similar models to other industries and geographical contexts for comparison and/or generalization of the findings.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because Funding has been used for the use of the data. Requests to access the datasets should be directed to juanjaime.arroyave@alu.uclm.es.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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REFERENCES

- Albort-Morant, G., Leal-Rodríguez, A., and De Marchi, L. (2018). Absorptive capacity and relationship learning mechanisms as complementary drivers of green innovation performance. *J. Knowl. Manag.* 22, 432–452. doi: 10.1108/JKM-07-2017-0310
- Alpkan, L., Yilmaz, C., and Kaya, N. (2007). Market orientation and planning flexibility in SMEs: performance implications and an empirical investigation. *Int. Small Bus. J.* 25, 152–172. doi: 10.1177/0266242607074518
- Anand, G., and Ward, P. T. (2004). Fit, flexibility and performance in manufacturing: coping with dynamic environments. *Prod. Oper. Manag.* 13, 369–385. doi: 10.5465/AMBPP.2004.13857614
- Astrachan, C. B., Patel, V. K., and Wanzanried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. *J. Fam. Bus. Strategy* 5, 116–128. doi: 10.1016/j.jfbs.2013.12.002
- Avermaete, T., Viae, J., Morgan, E. J., Pitts, E., Crawford, N., and Mahon, D. (2004). Determinants of product and process innovation in small food manufacturing firms. *Trends Food Sci. Technol.* 15, 474–483. doi: 10.1016/j.tifs.2004.04.005
- Bayona, C., Garcia-Marco, T., and Huerta, E. (2001). Collaboration in R&D with universities and research centres: an empirical study of Spanish firms. *R&D Manag.* 32, 321–341. doi: 10.1111/1467-9310.00264
- Bayona-Sáez, C., Garcia-Marco, T., and Huerta, E. (2001). Firms' motivations for cooperative R&D: an empirical analysis of Spanish firms. *Res. Pol.* 30, 1289–1307. doi: 10.1016/S0048-7333(00)00151-7
- Belk, R. (2018). "Foreword: the sharing economy" in *The rise of the sharing economy: Exploring the challenges and opportunities of collaborative consumption*. eds. P. A. Albinsson and B. Y. Perera (Santa Barbara, CA: Praeger), 9–12.
- Bentler, P. M. (2006). *EQS 6, structural equations program manual*. Encino, CA: Multivariate Software Inc.
- Browne, M. W., and Cudeck, R. (1993). "Alternative ways of assessing model fit" in *Testing structural equation models*. eds. K. A. Bollen and J. S. Long (Newbury Park, CA: Sage), 136–162.
- Byrne, B. M. (2013). *Structural equation modeling with EQS: Basic concepts, applications, and programming*. 2nd Edn. Lawrence Erlbaum Associates.
- Cainelli, G., Mazzanti, M., and Montresor, S. (2012). Environmental innovations, local networks and internationalization. *Ind. Innov.* 9, 697–734. doi: 10.1080/13662716.2012.739782
- Cainelli, G., Mazzanti, M., and Zoboli, R. (2011). Environmental innovations, complementarity and local/global cooperation: evidence from North-East Italian industry. *Int. J. Innov. Technol. Manag.* 11, 328–368. doi: 10.1504/IJTPM.2011.042090
- Carlsson, B. (1989). Flexibility and the theory of the firm. *Int. J. Ind. Organ.* 7, 179–203. doi: 10.1016/0167-7187(89)90018-0
- Cheng, C. C., Yang, C. L., and Sheu, C. (2014). The link between eco-innovation and business performance: a Taiwanese industry context. *J. Clean. Prod.* 64, 81–90. doi: 10.1016/j.jclepro.2013.09.050
- Chesbrough, H. (2003a). *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business School Press.
- Chesbrough, H. W. (2003b). The era of open innovation. *MIT Sloan Manag. Rev.* 44, 35–41.
- Christmann, P. (2000). Effects of "best practices" of environmental management on cost advantage: the role of complementary assets. *Acad. Manag. J.* 43, 663–680. doi: 10.2307/1556360
- Dangelico, R. M., Pontrandolfo, P., and Pujari, D. (2013). Developing sustainable new products in the textile and upholstered furniture industries: role of external integrative capabilities. *J. Prod. Innov. Manag.* 30, 642–658. doi: 10.1111/jpim.12013
- Davis, T. (1993). Effective supply chain management. *Sloan Management Review*, Summer, 35–46.
- De Marchi, V. (2012). Environmental innovation and R and D cooperation: empirical evidence from Spanish manufacturing firms. *Res. Policy* 41, 614–623. doi: 10.1016/j.respol.2011.10.002
- Díaz-García, C., González-Moreno, Á., and Sáez-Martínez, F. J. (2015). Eco-innovation: insights from a literature review. *Eco-innovation: Insights from a literature review* 17, 6–23. doi: 10.1080/14479338.2015.1011060
- Doran, J., and Ryan, G. (2016). The importance of the diverse drivers and types of environmental innovation for firm performance. *Bus. Strateg. Environ.* 25, 102–119. doi: 10.1002/bse.1860
- Fawcett, S. E., Calantone, R., and Smith, S. R. (1996). An investigation of the impact of flexibility on global reach and firm performance. *J. Bus. Logist.* 17:167.
- Ferdows, K., and De Meyer, A. (1990). Lasting improvements in manufacturing performance: in search of a new theory. *J. Oper. Manag.* 9, 168–184. doi: 10.1016/0272-6963(90)90094-T
- Fernández, E., Iglesias-Antelo, S., López-López, V., Rodríguez-Rey, M., and Fernandez-Jardon, C. M. (2019). Firm and industry effects on small, medium-sized and large firms' performance. *Bus. Res. Q.* 22, 25–35. doi: 10.1016/j.brq.2018.06.005
- Flynn, E., and Flynn, B. (1996). Achieving simultaneous cost and differentiation competitive advantages through continuous improvement: world class manufacturing as a competitive strategy. *J. Manag. Issues* 8, 360–379.
- Geczy, P., Isumi, N., and Hasida, K. (2014). Analytics-based management of information systems. *Rev. Bus. Finance Stud.* 5, 55–66.
- Gerwin, D. (1993). Manufacturing flexibility: a strategic perspective. *Manag. Sci.* 39, 395–410. doi: 10.1287/mnsc.39.4.395
- Giuliani, E., and Arza, V. (2009). What drives the formation of "valuable" university-industry linkages? Insights from the wine industry. *Res. Policy* 38, 906–921. doi: 10.1016/j.respol.2009.02.006
- González-Moreno, A., Triguero, A., and Sáez-Martínez, F. J. (2019). Many or trusted partners for eco-innovation? The influence of breadth and depth of firms' knowledge network in the food sector. *Technol. Forecast. Soc. Change* 147, 51–62. doi: 10.1016/j.techfore.2019.06.011
- González-Torres, T., Rodríguez-Sánchez, J. -L., Montero-Navarro, A., and Gallego-Losada, R. (2020). Visualizing research on industrial clusters and global value chains: a bibliometric analysis. *Front. Psychol.* 11:1754. doi: 10.3389/fpsyg.2020.01754
- Gupta, A. K., and Govindarajan, V. (1984). Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Acad. Manag. J.* 27, 25–41. doi: 10.2307/255955
- Hojnik, J., and Ruzzier, M. (2016). The driving forces of process eco-innovation and its impact on performance: insights from Slovenia. *J. Clean. Prod.* 133, 812–825. doi: 10.1016/j.jclepro.2016.06.002
- Horbach, J., Oltra, V., and Belin, J. (2013). Determinants and specificities of eco-innovations compared to other innovations—an econometric analysis for the French and German industry based on the community innovation survey. *Ind. Innov.* 20, 523–543. doi: 10.1080/13662716.2013.833375
- Hu, L., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55. doi: 10.1080/10705519909540118
- Jones, J., and Zubielqui, G. C. (2017). Doing well by doing good: a study of university-industry interactions, innovativeness and firm performance in sustainability-oriented Australian SMEs. *Technol. Forecast. Soc. Chang.* 123, 262–270. doi: 10.1016/j.techfore.2016.07.036
- Jové-Llopis, E., and Segarra-Blasco, A. (2018). Eco-efficiency actions and firm growth in European SMEs. *Sustainability* 10:281. doi: 10.3390/su10010281
- Kammerer, D. (2009). The effects of customer benefit and regulation on environmental product innovation: empirical evidence from appliance

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- manufacturers in Germany. *Ecol. Econ.* 68, 2285–2295. doi: 10.1016/j.ecolecon.2009.02.016
- Kemp, R., and Pearson, P. (2007). Final report MEI project about measuring eco-innovation. Available at: <https://www.oecd.org/env/consumption-innovation/43960830.pdf> (Accessed 2020).
- Kesidou, E., and Demirel, P. (2012). On the drivers of eco-innovations: empirical evidence from the United Kingdom. *Res. Policy* 41, 862–870. doi: 10.1016/j.respol.2012.01.005
- Kou, N., and Zhao, F. (2013). Operational flexibility: a key factor in the development of biofuel technologies. *Sustain. Energy Technol. Assess.* 1, 28–33. doi: 10.1016/j.seta.2012.12.002
- Kucuk, S. U. (2008). Consumer exit, voice and “power” on the internet. *J. Res. Consumers* 15, 1–13.
- Lutchen, K. R. (2018). Why companies and universities should forge long-term collaborations. Available at: <https://hbr.org/2018/01/why-companies-and-universities-should-forge-long-term-collaborations> (Accessed July 20, 2020).
- Mark, B. (1996). Organizational culture. *Annu. Rev. Nurs. Res.* 14, 145–163. doi: 10.1891/0739-6686.14.1.145
- Mascarenhas, C., Ferreira, J., and Marques, C. (2018). University-industry cooperation: a systematic literature review and research agenda. *Sci. Public Policy* 45, 708–718. doi: 10.1093/SCIPOL/SCY003
- McDonagh, P., and Prothero, A. (2014). Sustainability marketing research: past, present and future. *J. Destin. Mark. Manag.* 30, 1186–1219. doi: 10.1080/0267257X.2014.943263
- Moreno-Mondéjar, L., Triguero, Á., and Sáez-Martínez, J. F. (2020). Successful eco-innovators: exploring the association between open inbound knowledge strategies and the performance of eco-innovative firms. *Bus. Strateg. Environ.* 29, 939–953. doi: 10.1002/bse.2408
- Navaretti, G. B., Castellani, D., and Pieri, F. (2014). Age and firm growth: evidence from three European countries. *Small Bus. Econ.* 43, 823–837. doi: 10.1007/s11187-014-9564-6
- OECD (2009). Sustainable manufacturing and eco-innovation: framework, practices and measurement. Eco-innovation, synthesis report.
- Prahalad, C. K., and Ramaswamy, V. (2000). Co-opting customer competence. *Harv. Bus. Rev.* 78, 79–90.
- Rabadán, A., González-Moreno, A., and Sáez-Martínez, F. J. (2019). Improving firms’ performance and sustainability: the case of eco-innovation in the agri-food industry. *Sustainability* 11:5590. doi: 10.3390/su11205590
- Ringle, C. M., Sarstedt, M., Mitchell, R., and Gudergan, S. P. (2020). Partial least squares structural equation modelling in HRM research. *Int. J. Hum. Resour. Manag.* 31, 1617–1643. doi: 10.1080/09585192.2017.1416655
- Segarra-Oña, M. V., Peiró-Signes, A., and Mondéjar-Jiménez, J. (2013). Identifying variables affecting the proactive environmental orientation of firms: an empirical study. *Pol. J. Environ. Stud.* 22, 873–880.
- Shrivastava, P. (1995). Environmental technologies and competitive advantage. *Strateg. Manag. J.* 16, 183–200. doi: 10.1002/smj.4250160923
- Sobrinho, I., Labrador, J., and De Nicolas, V. L. (2019). Generational diversity in the workplace: psychological empowerment and flexibility in Spanish companies. *Front. Psychol.* 10:1953. doi: 10.3389/fpsyg.2019.01953
- Southwell, B. G. (2005). Information overload? Advertisement editing and memory hindrance. *Atl. J. Comm.* 13, 26–40. doi: 10.1207/s15456889ajc1301_2
- Tabachnick, B. G., and Fidell, L. S. (2007). *Using multivariate statistics*. 5th Edn. New York, NY: Allyn and Bacon.
- Triguero, A., Fernández, S., and Sáez-Martínez, F. J. (2018). Inbound open innovative strategies and eco-innovation in the Spanish food and beverage industry. *Sustain. Prod. Consum.* 15, 49–64. doi: 10.1016/j.spc.2018.04.002
- Triguero, A., and González-Moreno, A. (2019). *Research on eco-innovation strategies and eco-innovation in agro-food industries*. Oxford: Chartbridge Books, 25–35.
- Triguero, A., Moreno-Mondejar, M. L., and Davia, M. A. (2013). Drivers of different types of eco-innovation in European SMEs. *Ecol. Econ.* 92, 25–33. doi: 10.1016/j.ecolecon.2013.04.009
- Tumelero, C., Sbragia, R., and Evans, S. (2019). Cooperation in R and D and eco-innovations: the role in companies’ socioeconomic performance. *J. Clean. Prod.* 207, 1138–1149. doi: 10.1016/j.jclepro.2018.09.146
- Vargo, S. L., and Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *J. Mark.* 68, 1–17. doi: 10.1509/jmk.68.1.1.24036
- Vargo, S. L., Maglio, P. P., and Akaka, M. A. (2008). On value and value co-creation: a service systems and service logic perspective. *Eur. Manag. J.* 26, 145–152. doi: 10.1016/j.emj.2008.04.003
- Whiteman, W. E. (1998). Training and educating army officers for the 21st century: implications for the United States military academy. Fort Belvoir, VA: Defense Technical Information Center.
- Zhang, X., Ma, X., Wang, Y., and Wang, Y. (2014). How can emerging market small and medium-sized enterprises maximize internationalization benefits? The moderating effect of organizational flexibility. *Int. Small Bus. J.* 32, 667–692. doi: 10.1177/0266242613503356
- Zhang, Q., Vonderembse, M. A., and Lim, J. (2002). Value chain flexibility: a dichotomy of competence and capability. *Int. J. Prod. Res.* 40, 561–583. doi: 10.1080/00207540110091695

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Intra-Organizational Social Capital and Product Innovation: The Mediating Role of Realized Absorptive Capacity

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This paper examines the influence on product innovation of factors based on a company's transformation and exploitation of knowledge gathered from its intra-organizational relationships. Specifically, this paper analyses the influence of intra-organizational social capital (SC) (i.e., comprised of structural, relational, and cognitive dimensions) on realized absorptive capacity (RACAP). Moreover, it analyses the mediating role of RACAP on the relationship between internal SC and product innovation. Based on a sample of companies from the Spanish biotechnological and pharmaceutical industries, two hypotheses were tested using a structural equations model and the partial least squares (PLS) technique. The results support both hypotheses, suggesting that the development of strong and tightly knit links based on a common understanding and trust among company members lead the firm to develop dynamic capabilities for transforming and exploiting knowledge acquired externally, which fosters innovation based on new product development. Research limitations, implications and future research are also discussed by the authors of the paper.

Keywords: intra-organizational social capital, realized absorptive capacity, product innovation, biotechnology and pharma industries, mediating role

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INTRODUCTION

Social capital (SC) has become recognized as a powerful factor to explain success in a large number of areas that concern organizational researchers (Cuevas et al., 2014). Organizations can develop new knowledge and improve their performance through company links with other agents (Maurer et al., 2011). Moreover, a firm's network structure, along with high levels of engagement, cohesion, trust (Adler and Kwon, 2002; Mu et al., 2008) and a common vision (Doh and Acs, 2010; Alarcón et al., 2014), can help firms to detect innovation opportunities and be able to adapt to changes in the environment (Adler and Kwon, 2002).

Relationships within a company (intra-organizational or internal SC) are also an important driver for improving innovation procedures and promoting new ways to create value (Moran and Ghoshal, 1996). Intra-organizational SC could be defined as the organizational networks (Putman, 1993), trust, norms, mutual objectives and cooperation that exist between organization members (Fukuyama, 1995, 2001). It is an intangible asset based on the knowledge arising from the interaction of company employees (Adler and Kwon, 2002; Ben Hador, 2016; Ben Hador and Klein, 2019).

Several studies have shown the key role of absorptive capacity in innovation (see e.g., Fosfuri and Tribó, 2008; Cepeda et al., 2012; Leal-Rodríguez et al., 2014; Xie et al., 2018; Limaj and Bernroider, 2019). Absorptive capacity can be defined as a dynamic capability that allows companies to acquire and assimilate external knowledge [potential absorptive capacity (PACAP)], which has to be internally transformed and exploited [realized absorptive capacity (RACAP)] in order to create competitive advantages (Zahra and George, 2002). However, most of the existing research does not consider that each of these dimensions (PACAP and RACAP) could have different antecedents, which also condition the innovation process (Rodrigo-Alarcón et al., 2020). This paper suggests that literature on knowledge management (KM) should consider distinctly the analysis of knowledge transformation and application that comes from their intra-organizational relationship, and the abilities that the company must develop to absorb and exploit knowledge for innovative purposes (Ebers and Maurer, 2014).

Recent studies have shown, from a qualitative point of view, how internal SC positively impacts performance in knowledge-intensive contexts (Salas–Vallina et al., 2020). Other papers have analyzed the relationships between SC and PACP (knowledge identification capability and external knowledge acquisition) (Ortiz et al., 2017, 2018), and others have focused on examining the mediating role of absorptive capacity (PACAP and RACAP) on the relationship of SC and innovation (Duodu and Rowlinson, 2019; Wang et al., 2020). However, most of them have focused on analyzing SC from an external or inter-organizational point of view. We consider that a deeper quantitative analysis of how internal or intra-organizational SC contribute to the creation of new knowledge on the part of company members is important in order to understand how such knowledge can decisively improve company performance and, in particular, produce innovation results. In this regard, a contributing idea from this paper is that the company must develop the ability to assimilate and integrate the new knowledge of employees, coming from its intra-organizational SC, into its common knowledge base in order to improve its innovation capabilities.

Similarly, researchers have thoroughly explored the impact of intra-organizational SC on different innovation performance measures, but the empirical results are not conclusive about the nature of such a relationship. In that sense, there are authors that find positive, negative and even inverted U-shaped effects of internal SC on innovation. Different reasons can explain such divergent results. First, SC provides opportunities to an organization's members to acquire new knowledge, but its impact on organizational performance depends on the way this knowledge is assimilated and used by the firm. Different kinds of knowledge (tacit, explicit) can also have different potential to impact on innovation performance.

We consider that one of the main reasons for these findings is based on the fact that research on this matter has not taken sufficient account of the mediating role that capabilities related to knowledge transformation and exploitation might have on the relationship between intra-organizational SC and innovation. Therefore, in order to bridge this gap, we propose in this paper that product innovation capabilities are strongly

affected by the RACAP mediating effect, with internal SC being the main antecedent. This paper contributes to the growing research field on SC and its effects on product innovation through seeking a deeper understanding of intra-organizational SC assessment for creating organizational value. It could also be helpful to clarify the role of internal SC as an antecedent of RACAP, which has been as yet unexplored (Ebers and Maurer, 2014). The need to specify individually the antecedents of each dimension of the absorptive capacity construct has been justified empirically (Jansen et al., 2005; Ojo et al., 2017). In this sense, our literature review finds evidence about how resources based on a mutual common understanding, trust and strong links between employees foster the development of abilities for transforming and exploiting knowledge.

The structure of the paper is as follows. First, the conceptual aspects and research hypotheses are developed. Second, the sample and the research methodology are described. Next, the statistical testing of the hypotheses in a sample of Spanish companies in the biotechnological industry is analyzed. Finally, we present the main conclusions, limitations and future research lines which could improve our understanding of the influence of intra-organizational SC on innovation capabilities and the role of RACAP.

CONCEPTUAL FRAMEWORK

Social capital is “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (Nahapiet and Ghoshal, 1998, p. 243). This research paper considers this approach as being the most comprehensive in explaining the SC construct for two reasons: (1) It allows SC to be integrated as a multidimensional construct according to the value of exchanged resources and capabilities among agents in a network; and (2) it makes it easier to analyze a company's relationships from both inside (intra-organizational SC) and outside (inter-organizational SC) organizational borders.

In addition, Nahapiet and Ghoshal's dimensional differentiation – *structural, relational and cognitive* – is used extensively by academics in the SC field (Zheng, 2010; Hsu and Hung, 2013). The *structural dimension* is characterized by all the interactive aspects present in the relationships between network members (Tsai and Ghoshal, 1998). Those elements are related to the network's density and stability over time to both the greater and weaker strength of the connection between agents and their frequency and closeness (Inkpen and Tsang, 2005). Moreover, the *relational dimension* relates to assets, such as trust or reliability, which come from the relation and interaction between network members. In this dimension, the positive interactions between individuals or organizations over the years are included as sources of SC (Lesser, 2000). Lastly, the *cognitive dimension* describes shared codes that improve the mutual understanding of aims and behaviors within a social system (Tsai and Ghoshal, 1998; Blasco et al., 2010). The main aspects that define this dimension are common goals and a shared culture. These dimensions are intrinsically interlinked,

and their joint analysis thus is crucial for a better understanding of how to exploit knowledge gained from a firm's relations and to explain innovation performance (Martínez et al., 2012).

According to SC literature, innovation is the result of the connections, interdependences and exchanges of knowledge between a variety of agents in different circumstances (Landry et al., 2002). Thus, the influence of SC on knowledge creation and innovation has been extensively discussed in a number of academic papers (Nahapiet and Ghoshal, 1998; Gargiulo and Benassi, 2000; Moran, 2005; Chen et al., 2008; Zheng, 2010; Martín et al., 2011; Sánchez-Famoso et al., 2017; Ben Hador and Klein, 2019, among others). In that sense, different researchers have confirmed the impact of internal (intra) SC on innovation. However, we do not find conclusive empirical results regarding the nature of the connection between this kind of SC and innovation or how this connection works.

Some authors state that the ability to access and mobilize resources through internal relations is a key factor for improving innovation results (see e.g., Moran, 2005; Casanueva and Gallego, 2010; Delgado et al., 2011; Gu et al., 2013; Yan and Guan, 2018; Yeşil and Doğan, 2019). Another branch of research shows a negative relationship (see e.g., Gargiulo and Benassi, 2000; Edelman et al., 2004; Fleming et al., 2007; Sánchez-Famoso et al., 2017), explained by the fact that cohesive networks cause organizational inertia, provoke resistance to change and reduce the dissemination of new ideas. Finally, other studies reveal an inverted U-shape (see e.g., Leenders et al., 2003; Shi and Guan, 2016; Wang et al., 2017), explaining that both low and high levels of internal interaction hinder the development of creativity and innovation. In order to fill this gap, this research considers that the ability of companies to benefit from knowledge that arises from internal interactions is crucial in determining their strategic potential for creating competitive advantage related to innovation. Specifically, we propose that knowledge transformation and exploitation abilities (RACAP) can be helpful to explain the positive effect of internal SC on product innovation¹.

Knowledge management literature points out how an effective knowledge absorption process enables a firm to improve its capabilities for dealing with changing environments and to be innovative and competitive (Cohen and Levinthal, 1989; Zahra and George, 2002; Todorova and Durisin, 2007; Escribano et al., 2009; Jiménez-Barrionuevo et al., 2011). According to Zahra and George (2002), absorptive capacity encompasses a set of organizational routines and strategic processes through which firms acquire and assimilate (PACAP), transform and apply (RACAP) knowledge with the aim of creating dynamic organizational capability. We consider that especially the internal abilities related to combining new and existing knowledge as well as the capabilities for improving, expanding and exploiting these combinations (Zahra and George, 2002) can encourage intra-organizational social interaction and resource exchange, which

in turn will create new knowledge and ideas which foster greater product innovation.

On the one hand, as RACAP processes are internally developed (Cohen and Levinthal, 1989), it is typically considered that structural, relational and cognitive aspects of intra-organizational SC could have an important influence on them. In this respect, Ebers and Maurer (2014) asserted that when a company's members have strong links, a common understanding about task development and mutual trust, its abilities to transform and use knowledge improves. Likewise, Selivanovskikh et al. (2020) stressed that high intensity of interaction between company members and social embeddedness encourages cooperation, communication as well as trustworthy and reliable behavior, all of which enable knowledge assimilation and exploitation. Strong ties provide a company with rich communication channels through which its members can exchange valuable knowledge that can be adapted and developed for new purposes (Levin and Cross, 2004; Smith et al., 2005). Similarly, close interaction facilitates knowledge mobilization and feedback loops, helping company members to understand knowledge obtained from others (Leonard-Barton and Sinha, 1993), and fosters joint problem resolution (McEvily and Marcus, 2005). In that sense, Upadhyayula and Kumar (2004) found that strong links developed in working environments are very important for employees when they seek advice regarding how to carry out specific tasks and procedures.

Moreover, trust between organization members increases the likelihood of new individual knowledge integration within a company knowledge base by means of its transformation, thus creating collective organizational knowledge (Tsai and Ghoshal, 1998; Wu, 2008; Selivanovskikh et al., 2020). Strong organizational bonds and a sense of reciprocity can facilitate knowledge mobilization inside the company as organization members will be motivated to share knowledge and information with those whom they trust (Uzzi, 1999). Additionally, trust acts as a social control mechanism that has a positive influence on both the amount of mobilized knowledge and the efficiency of that mobilization (Dyer and Nobeoka, 2000; Lane et al., 2001; Molina and Martínez, 2010). If company members rely on each other, they will sense that their know-how is trustworthy and safe (Fischer et al., 2004; Schoorman et al., 2007), and the likelihood that they transform and use each other's knowledge will be higher (Mayer et al., 1995). This avoids concerns about opportunistic behavior (Galán and Castro, 2004), reduces the cost of knowledge search and verification (Dyer and Chu, 2003) and increases the probability and the efficiency of its further use (Selivanovskikh et al., 2020).

Finally, cognitive SC appears as a key factor that affects knowledge assimilation, transformation and exploitation (Rodrigo-Alarcón et al., 2020). In that sense, common and clear goals foster mutual understanding and exchange of ideas (Chow and Chan, 2008), which create a feedback loop that allows agents to understand and apply knowledge in a new and creative manner (Leonard-Barton and Sinha, 1993). Similarly, organizational culture ensures the appropriate context for social interaction (Máñez et al., 2012), and then enhances successful organizational KM (De Long and Fahey, 2000;

¹Product innovation has especially attracted interest from a number of organizational researchers as a result of absorptive capacity deployment when high-technology intensive industries are considered (Wang and Ahmed, 2007; Donate and Guadamillas, 2010).

Donate and Guadamillas, 2010). A company's culture builds organizational rules and beliefs that can foster knowledge creation, such as improving learning and knowledge use at a variety of organizational levels (Naqshbandi and Kamel, 2017). From a resource-based view, this organizational culture for social interaction is an intangible asset that offers rent appropriation potential as it is embedded in the company's processes and management systems, which makes it highly specific (Barney, 1991). This specificity involves a link to a company's idiosyncratic KM processes and learning trajectories, all of which can basically be considered as RACAP resources (Zahra and George, 2002).

Additionally, company culture can contribute to avoiding the development of undesired behaviors in companies, such as change resistance, and encourages those others that boost knowledge assimilation and application, such as pro-activity, creativity or flexibility. Therefore, it would be expected that intra-organizational SC has a positive influence on RACAP. Thus, we hypothesize the following:

H₁: Intra-organizational SC is positively related to RACAP.

On the other hand, there are many empirical studies that show the importance of the absorptive capacity for the innovation process (e.g., Cohen and Levinthal, 1989; Fosfuri and Tribó, 2008; Murovec and Prodan, 2009; Cepeda et al., 2012; Leal-Rodríguez et al., 2014; Ferreras et al., 2015; Xie et al., 2018; Limaj and Bernroider, 2019). For example, authors such as Fosfuri and Tribó (2008) emphasize that PACAP is a necessary, but not sufficient, requirement for accomplishing competitive advantages based on innovation. Companies also need to develop their RACAP, for which knowledge flows becomes essential to create new ideas, know-how and products. Similarly, Cepeda et al. (2012) or Xie et al. (2018) confirm that a firm's absorptive capacity has a positive impact on a firm's innovation performance, as knowledge transformation and exploitation abilities are vital for producing more innovation outputs. However, very few research papers consider how each distinctive facet of a company's entire absorptive capacity has a specific effect on innovation capabilities (e.g., Cepeda et al., 2012; Leal-Rodríguez et al., 2014; Xie et al., 2018).

Theoretically, RACAP, as a dynamic capability, should allow a firm to adapt its knowledge base to deal with changing environments (Wang and Ahmed, 2007). The ability to sense new business opportunities by understanding how newly acquired knowledge can be integrated or adapted to the existing technological resources and capabilities are path-dependent of previous learning processes. Deliberated and experience-based learning investments are needed in order to develop such abilities (Zollo and Winter, 2002) and convert them into a source of competitive advantage, as they are valuable and inimitable (Barney, 1991).

From these arguments, this paper suggests that new knowledge from company members derived from internal SC can increase in value if its assimilation and integration into the firm's common knowledge base is properly done. In that case, this kind of knowledge could also become a source of new innovative results. Consequently, when a firm has not properly developed

these abilities, the achievement of benefits from internal SC is limited (Yu, 2013). For this reason, a company's capabilities to absorb and exploit knowledge will mediate the relationship between intra-organizational SC and its product innovation capabilities. This second hypothesis is formulated as follows:

H₂: A company's RACAP will have a mediating effect on the relationship between intra-organizational SC and product innovation capabilities.

SAMPLE AND METHODOLOGY

The empirical analysis was carried out based on a sample of Spanish companies from innovation-intensive industries such as biotechnology and the pharmaceutical industry, where RACAP is an essential capability. To collect company data and information, the SABI (a system for accounting information analysis in Spanish and Portuguese firms) database was used. As the search we used a criterion the Spanish industry classification CNAE-2009, achieving a population of 735 firms. Consequently, an on-line survey was designed and launched, including questions relating to innovation, absorptive capacity and SC. As a previous step to launching the survey, a pre-test was conducted in order to analyze its reliability².

For the measurement of the research variables, we adapted Likert scales from 1 to 7, which other studies have previously used and validated (see **Appendix** for the list of items). Measures for the variables of the study included the following: (1) eight items about the firm's realized absorptive capacity (R_AC) according to Jansen et al. (2005); (2) 14 items representing intra-organizational SC (INT_SC)³ according to Tsai and Ghoshal (1998), Maurer et al. (2011), Máñez et al. (2012), Cuevas et al. (2014), and Horn et al. (2014); and (3) five items reflecting product innovation (PROD_INN) based on Škerlavaj et al. (2010). The research specifications are included in **Table 1**.

²Several scholars with an extensive publication record in KM and/or intellectual capital from the Business Department of Castilla-La Mancha University reviewed a draft of the questionnaire. Following this, various in-depth interviews with the CEOs of two biotechnological companies were carried out. Subsequently, the authors deleted or changed those items that seemed to be difficult to respond to or to understand.

³Five items corresponding to structural social capital, four items to relational social capital and five items regarding cognitive social capital.

TABLE 1 | Research specifications.

Population	735
Geographical scope	Spain
Sample size	87 firms
Unit of analysis	Firm or business unit
Data collection method	Online survey
Response rate	11.84%
Sampling error	9.87%; $p = q = 0.5$
Confidence level	95%
Type of sampling	Convenience

Finally, the Harman Test⁴ was applied to evaluate if the existence of common variance could be a concern for the collected set of data. This analysis confirms our study's data validity.

STATISTICAL ANALYSIS AND RESULTS

For testing the hypotheses, a structural equation model (SEM) using the partial least squares (PLS) technique and SmartPLS 3.2. software was applied. PLS is a multivariate analysis technique (Wold, 1985), based on variance analysis, used to model latent constructs under non-normality conditions for data and small sample sizes (Hair et al., 2013), which is typically applied in two stages:

Measurement Model

Confirmatory factor analysis was used to estimate the measurement model in order to assess the reliability (individual items and constructs) and convergent and discriminant validity of measures. The findings (**Table 2**) corroborate the reliability and validity of the measurement model.

Individual item reliability was assessed using standardized loadings (λ), which is acceptable when the value is at least 0.707 (Chin, 1998; Hair et al., 2013). Moreover, construct reliability was analyzed by the Composite Reliability Index (CRI). The CRI must be at least 0.7 in early research stages and reach a stricter value of 0.8 for more advanced research stages (Nunnally, 1978).

Convergent validity is analyzed by examining the average variance extracted (AVE), which should be higher than 0.5 as a minimum value (Fornell and Larcker, 1981). Finally, discriminant validity confirms the extent of a construct being structurally different from other constructs. For that purpose, the AVE for each construct should be higher than the variance that such a construct shares with the rest of the model constructs (Fornell and Larcker, 1981).

Structural Model

The structural model analysis is applied for testing the proposed hypotheses by analyzing both path coefficients (β) and determination coefficients (R^2) (**Figure 1**). Specifically, for the examination of the direct influence of intra-organizational SC on RACAP (H_1), the relationship between both variables is positive and significant ($\beta = 0.666$ $p < 0.001$). As a result, this first hypothesis is supported (**Table 3**).

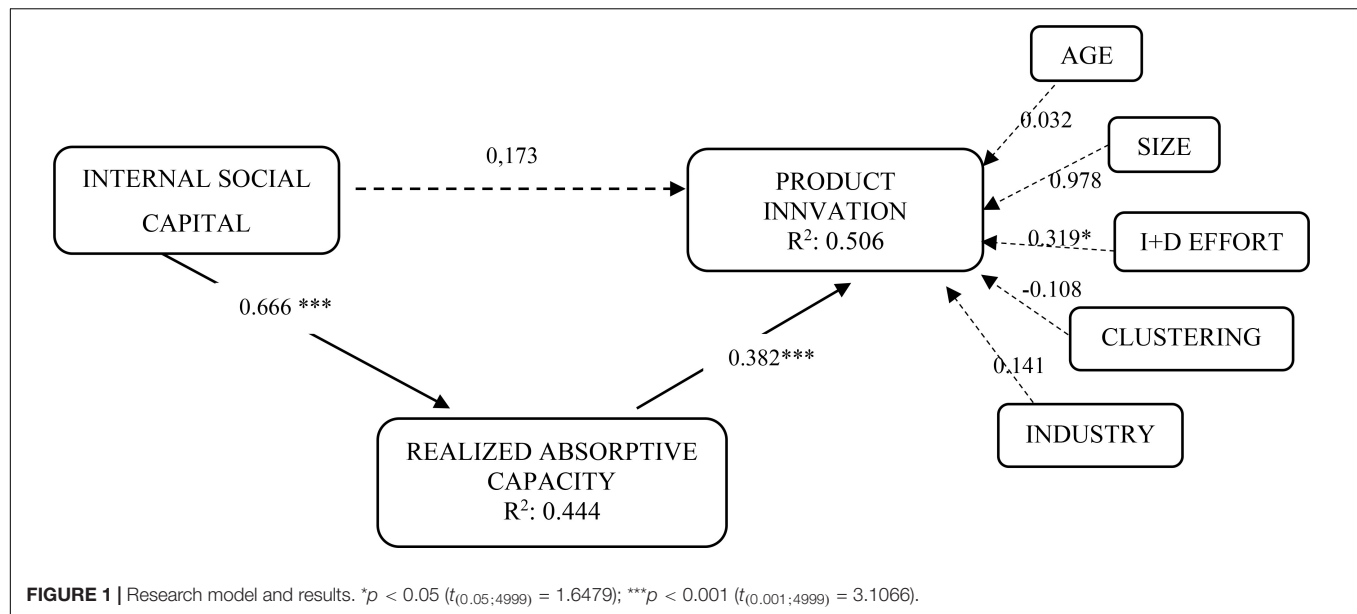
Partial least squares uses bootstrapping for testing mediating effects, providing indicators for both direct and indirect effects (Hayes and Scharkow, 2013). According to Nitzl et al. (2016), the results must comply with four conditions (**Table 4**). Specifically, for the mediating effect proposed by H_2 , the indirect effect between intra-organizational SC and product innovation when

⁴An exploratory factorial analysis (principal components with varimax rotation) was implemented. The results reveal four factors with eigenvalues above one, explaining 67.5% of the total variance. Because the first factor explains only 37.4% percent of the total variance, common variance does not appear to be a major problem in our research (Podsakoff and Organ, 1986).

TABLE 2 | Measurement model.

Constructs	Range of loadings			CR	AVE	Correlations					
	INT_SC	INT_SSC	INT_RSC	INT_CSC	R_AC	ASIM/TRANSF	EXPLOT	PROD_INN			
INT_SC (2nd order)	0.897										
INT_SSC		0.841*									
INT_RSC		0.364	0.954*								
INT_CSC		0.791	0.705	0.867*							
R_AC (2nd order)					0.841						
ASIM/TRANSF			0.611	0.715		0.830*					
EXPLOT			0.267	0.366		0.456	0.766*				
PROD_INN			0.364	0.506		0.580	0.311	0.755			

*Root of the variance shared between the first-order constructs and their measures. Diagonal elements (in *italics*) are the square root of the variance shared between the constructs and their measures; off-diagonal elements are the correlations between the items/constructs; for discriminant validity, diagonal elements should be higher than off-diagonal elements in the same row and column (Fornell and Larcker, 1981).

**TABLE 3 |** Hypothesis 1 test.

Effect on dependent variable	Path coefficient (β)	t	Confidence interval 95%
INT_SC \rightarrow R_AC	0.666***	9.998	0.528–0.789

*** $p < 0.001$ ($t_{(0.001;4999)} = 3.1066$).

TABLE 4 | Mediating hypothesis 2 test.

Effect on dependent variable INT_SC \rightarrow PROD_INN	Path coefficient (β)	t	Confidence interval 95%
Direct	0.178	1.278	–0.101 to 0.423
Indirect	0.255***	3.149	0.118 to 0.425

*** $p < 0.001$ ($t_{(0.001;4999)} = 3.1066$).

the mediating variable RACAP is introduced in the research model is strong and highly significant ($\beta = 0.255$, $p < 0.001$). However, the direct path coefficient in the relationship between internal SC and product innovation is not significant when the mediating variable is introduced into the research model ($\beta = 0.178$, $p > 0.05$). Consequently, there is a total mediating effect of RACAP on the relationship between intra-organizational SC and product innovation. In order to complement this analysis, a percentile approach was applied, for both direct and indirect effects. The results confirm that only the relationship between intra-organizational SC and product innovation shows a confidence interval that contains the zero value when the mediating variable is introduced into the research model, remaining significant for all the other effects (Chin, 2010).

Furthermore, R^2 coefficients indicate the amount of variance explained by the relationships in the model. **Figure 1** shows that the model explains 50.6% of the variance of product innovation and 44.4% of the variance of RACAP. Authors such as Falk and Miller (1992) suggest that this value should be at least 10% for

a model to be considered as having enough predictive power, a condition fulfilled by our study model.

Finally, regarding control variables, only R&D effort has a significant effect on product innovation ($\beta = 0.319$, $p < 0.05$). This is a logical result if we consider that those firms that make higher innovation efforts achieve an increase in their ability to create new products.

DISCUSSION AND CONCLUSION

This study has shown the existing relationships between intra-organizational SC, RACAP and product innovation capabilities in a sample of firms in the Spanish biotechnological industry. The testing of the model shows the positive impacts of, on the one hand, internal SC (a construct that includes structural, relational and cognitive SC) and RACAP (hypothesis 1) and, on the other hand, RACAP and a company's product innovation capabilities. As explained in our theoretical background section,

innovation capabilities have been shown to be a positive result of the development of RACAP in different contexts (Ebers and Maurer, 2014; Leal-Rodríguez et al., 2014; Flor et al., 2018). A firm that is capable of integrating transforming and adjusting external knowledge to its existing knowledge base will have further opportunities to learn how to develop innovative activities such as new product development (Cohen and Levinthal, 1989; Schilling, 2019).

Regarding the first hypothesis, the obtained results support the idea that firmly established and frequent links between a company's employees, trusting relationships and the development of common codes to interact with one another lead a firm to improve its capacity to integrate/transform and use knowledge. Maurer et al. (2011) used the concept of knowledge transfer processes in order to give an explanation regarding the positive relationship between intra-organizational relationships and dynamic capabilities to exploit external knowledge. Increasing interactions between employees (coupled with knowledge transfer) give the firm the opportunity to identify where external resources and how newly acquired knowledge should be integrated into other existing resources when personal knowledge is highly disseminated in a firm. In fact, as RACAP is a function of patterns of learning in a firm, the more a firm's employees try to seek out peers and interaction elsewhere to solve problems, the more the company learns to find solutions based on knowledge exploitation over time.

At this point, it is also important to differentiate between PACAP and RACAP and the role they play regarding knowledge acquisition and its exploitation by firms. While PACAP is closely connected with knowledge identification and assimilation, and inter-organizational relationships are thus essential aspects for detecting sources to acquire knowledge, RACAP is more dependent on internal processes to learn how to exploit the acquired knowledge (Ortiz et al., 2018). These internally learned processes are guided by the way a company is able to manage employees' interactions to transfer tacit and codified knowledge by means of networks based on trust and shared understandings about behaviors, the functioning of activities and its competitive objectives.

On the whole, internal SC is likely to create routines for transforming and using new knowledge as employees will be able, owing to the presence of personal and company networks, trust and common norms, to test newly acquired technology with trusted colleagues, and also eschew knowledge which has no practical use for the running of company activities. Moreover, internal SC would have a positive effect on the organization's ability to mitigate the potential confusion from the knowledge that a firm obtains from internal networks, improving KM internally (Jensen and Szulanski, 2007).

Moreover, the results of the study show that RACAP can be seen as a way to channel internal SC toward innovation. While most of the SC literature predicts a positive, direct impact of SC on product innovation (see e.g., Zheng, 2010; Yu, 2013; Xie et al., 2018), this paper shows that the empirical results of these studies may not be conclusive, as ideas and knowledge resulting from internal interactions should be previously integrated and exploited through dynamic capabilities for sensing and seizing

new opportunities in a constantly changing environment (Teece et al., 1997). We thus propose a mediating relationship based on the absorptive capacity to understand the connection between internal SC and innovation. An important result of our study is the *total* mediating effect that has been found in our tested model by considering RACAP as the intermediate step between intra-organizational relationships and product innovation. This provides insights regarding the predecessors of RACAP, which is still considered a "black box" regarding competitive advantages based on innovation (Peeters et al., 2014), especially for the difficulty it poses to company management in practice. The total mediating effect means that when RACAP is introduced into the empirical model, the direct relationship between internal SC and product innovation ceases to be significant, meaning that internal SC without RACAP does not lead to knowledge resources based on networks achieving an improvement in innovation capabilities. From a managerial viewpoint, this result has an important implication: a firm should be aware that the promotion of intra-organizational relationships by means of developing shared values for knowledge exchange, and further (and firmly established) trustworthy links between employees should be connected to R&D efforts and the constant scanning for new opportunities to gain further innovation.

A theoretical implication for KM and SC literature comes from the confirmation of the total mediating effect in the second hypothesis. Hence, this paper has shown that RACAP allows firms to reconfigure and renew their knowledge base following a specific strategic direction (Wang and Ahmed, 2007). For a company, this would mean that its knowledge base is built over time and subject to path dependencies, and therefore not easily imitated by competitors (Barney, 1991). The abilities relating to the understanding of new opportunities through the identification and valuation of the firm's internal technologies along with the understanding of how these technologies can interact with externally acquired knowledge shape the fundamentals of RACAP. Deliberated and experience-based learning investments would be needed in order to develop such abilities (Zollo and Winter, 2002). Moreover, a firm's strategic focus will have an important influence on such development. This means that different strategies (e.g., cost leadership, differentiation) would influence a firm's position with respect to knowledge exploitation, exploration or both (Wang and Ahmed, 2007). Although internal SC has been analyzed as an antecedent of RACAP in hypothesis one, a firm's strategic focus is an aspect that has not been explicitly contemplated by our model. Future papers could take into consideration this relationship as an interesting line of research.

The study results have interesting prescriptive implications for company managers in high-tech industries such as biotechnology. First, managers should understand that "good" management of intra-organizational SC allows their companies to develop dynamic capabilities related to the exploitation of unique and complex knowledge. The ultimate goal is to expand, reconfigure and adapt their resources in order to deal with environmental change (Teece et al., 1997; Eisenhardt and Martin, 2000). Moreover, the development of cohesive links, along with common values and clear rules of exchange

regarding internal knowledge should be oriented to improve their RACAP. By doing so, organizations could optimize their knowledge exploitation processes by selecting the best method(s) for integrating external and internal knowledge depending on their needs, timing, and particular circumstances (e.g., strategy). Furthermore, the study of the existing relationships between SC dimensions leads to a better understanding of their internal functioning and configuration, which constitutes an important issue for managers, who should consider not only the relevance of each type of SC for knowledge integration but also the value added that arises from their interdependencies.

An additional managerial implication of this paper is that it is necessary to develop strong and frequent links between employees in firms (structural internal SC) but it is also essential to create and develop cognitive SC (e.g., common rules; shared language) to take advantage of innovation via RACAP. The way in which firms develop and improve these social norms and mindsets has not been the focus of this paper, but it could be an interesting avenue for future research (e.g., how network agents should interact; how they should manage such processes).

Among the limitations of this study, we include, firstly, the cross-sectional nature of the empirical analysis. Furthermore, the study does not consider if there are dependent relationships between the structural, relational and cognitive dimensions of inter-organizational SC and RACAP, neither their influence on product innovation capability. Future studies may focus on such analysis. Additionally, we used self-reporting data. Despite the applied Harman test not showing this issue to be of significant concern, problems of common method variance could be present. Finally, we focus on the high knowledge-intensive industries to test our hypotheses, which might restrict the generalizability of the findings to additional industries or sectors with different features. To address this limitation, the study could be replicated for validation purposes in other contexts (low-tech industries; other countries). Also, a longitudinal study could be carried out, focusing on the analysis of how network and absorptive capacity configuration and relationships change over time and the influence of this on innovation performance.

Overall, internal social interactions are shown as mechanisms that allow people to learn how to share important information

with each other, create a common understanding related to tasks or goals, as well as obtain other resources and ideas (Xie et al., 2018), in order to generate innovation via knowledge integration with other assets and their transformation. The generation and application of new ideas will therefore be promoted by social interaction, or in other words, the generation and application of new ideas to achieve further innovation will be promoted by a firm's inter/organizational SC.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

FG wrote the Introduction. BO developed the research model, the theoretical background, and fieldwork and empirical analysis. MD contributed with Discussion and Conclusion sections. However, there was continuous feedback among the authors over all research period. All authors contributed to the article and approved the submitted version.

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REFERENCES

- Adler, P., and Kwon, S. (2002). Social capital: prospect for a new concept. *Acad. Manag. Rev.* 27, 17–40.
- Alarcón, J. R., Villaverde, P. M. G., Requena, G. P., and Ortega, M. J. R. (2014). La capacidad de absorción como factor conductor del capital social cognitivo hacia la innovación. *Econ. Industr.* 391, 33–42.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *J. Manag.* 17, 99–120. doi: 10.1177/014920639101700108
- Ben Hador, B. (2016). How intra-organizational social capital influences employee performance. *J. Manag. Dev.* 35, 1119–1133. doi: 10.1108/jmd-12-2015-0172
- Ben Hador, B., and Klein, G. (2019). Act your age? Age, intrapreneurial behavior, social capital and performance. *Emp. Relat.* 42, 349–365. doi: 10.1108/er-01-2019-0059
- Blasco, P., Navas, J. E., and López, P. (2010). El efecto mediador del capital social sobre los beneficios de la empresa: una aproximación teórica. *Cuad. Estud. Empres.* 20, 11–34.
- Casanueva, C., and Gallego, Á. (2010). Social capital and innovation: an intra-departmental perspective. *Manag. Revue* 21, 135–154. doi: 10.5771/0935-9915-2010-2-135
- Cepeda, G., Cegarra, J. C., and Jiménez, D. (2012). The effect of absorptive capacity on innovativeness: context and information systems capability as catalysts. *Br. J. Manag.* 23, 110–129.
- Chen, M., Chang, Y., and Hung, S. (2008). Social capital and creativity in R&D project teams. *R&D Manag.* 38, 21–33. doi: 10.1111/j.1467-9310.2007.00494.x
- Chin, W. W. (1998). Issues and opinion on structural equation modelling. *MIA Quarterly* 22, 7–16.

- Chin, W. W. (2010). "How to write up and report PLS analyses," in *Handbook of Partial Least Squares*, eds V. E. Vinzi, W. W. Chin, J. Henseler, and H. Wang (Berlin: Springer-Verlag), 665–690.
- Chow, W. S., and Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Inform. Manag.* 45, 458–465. doi: 10.1016/j.im.2008.06.007
- Cohen, W. M., and Levinthal, D. A. (1989). Innovation and learning: the two faces of R&D. *Econ. J.* 99, 569–596. doi: 10.2307/2233763
- Cuevas, G., Cabello, C., and Carmona, A. (2014). Internal and external social capital for radical product innovation: do they always work well together? *Br. J. Manag.* 25, 266–284. doi: 10.1111/1467-8551.12002
- De Long, D. W., and Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Acad. Manag. Perspect.* 14, 113–127. doi: 10.5465/ame.2000.3979820
- Delgado, M., Martín, G., Navas, J. E., and Cruz, J. (2011). Capital social, capital relacional e innovación tecnológica. una aplicación al sector manufacturero español de alta y media tecnología. *Cuader. Econ. Direc. Emp.* 14, 207–221.
- Doh, S., and Acs, Z. J. (2010). Innovation and social capital: a cross-country investigation. *Industry Innov.* 17, 241–262. doi: 10.1080/13662711003790569
- Donate, M. J., and Guadamillas, F. (2010). Estrategia de gestión del conocimiento y actitud innovadora en empresas de castilla-la mancha. un estudio exploratorio. *Investigac. Eur. Direc. Econ. Emp.* 16, 31–54. doi: 10.1016/s1135-2523(12)60002-1
- Duodu, B., and Rowlinson, S. (2019). The effect of social capital on exploratory and exploitative innovation. *Eur. J. Innov. Manag.* 23, 649–674. doi: 10.1108/ejimm-08-2018-0178
- Dyer, J. H., and Chu, W. (2003). The role of trustworthiness in reducing transaction costs and improving performance: empirical evidence from the United States, Japan, and Korea. *Organ. Sci.* 14, 57–68. doi: 10.1287/orsc.14.1.57.12806
- Dyer, J. H., and Nobeoka, K. (2000). Creating and managing a high-performance knowledge-sharing network: the toyota case. *Strat. Manag. J.* 21, 345–367. doi: 10.1002/(sici)1097-0266(200003)21:3<345::aid-smj96>3.0.co;2-n
- Ebers, M., and Maurer, I. (2014). Connections count: how relational embeddedness and relational empowerment foster absorptive capacity. *Res. Policy* 43, 318–332. doi: 10.1016/j.respol.2013.10.017
- Edelman, L. F., Bresnen, M., Newell, S., Scarbrough, H., and Swan, J. (2004). The benefits and pitfalls of social capital: empirical evidence from two organizations in the United Kingdom. *Br. J. Manag.* 15, S59–S69.
- Eisenhardt, K., and Martin, J. (2000). Dynamic capabilities: what are they? *Strat. Manag. J.* 21, 105–121.
- Escribano, A., Fosfuri, A., and Tribó, J. A. (2009). Managing external knowledge flows: the moderating role of absorptive capacity. *Res. Policy* 38, 96–105. doi: 10.1016/j.respol.2008.10.022
- Falk, R. F., and Miller, N. B. (1992). *A Primer for Soft Modeling*. Akron, OH: The University of Akron.
- Ferreras, J. L., Newell, S., Fernández-Mesa, A., and Alegre, J. (2015). Depth and breadth of external knowledge search and performance: the mediating role of absorptive capacity. *Indust. Market. Manag.* 47, 86–97. doi: 10.1016/j.indmarman.2015.02.038
- Fischer, G., Scharff, E., and Ye, Y. (2004). *Fostering Social Creativity by Increasing Social Capital. Social Capital and Information Technology*. Cambridge, MA: MIT Press, 355–399.
- Fleming, L., Mingo, S., and Chen, D. (2007). Collaborative brokerage, generative creativity, and creative success. *Administ. Sci. Q.* 52, 443–475. doi: 10.2189/asqu.52.3.443
- Flor, M. L., Cooper, S. Y., and Oltra, M. J. (2018). External knowledge search, absorptive capacity and radical innovation in high-technology firms. *Eur. Manag. J.* 36, 183–194. doi: 10.1016/j.emj.2017.08.003
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312
- Fosfuri, A., and Tribó, J. A. (2008). Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega* 36, 173–187. doi: 10.1016/j.omega.2006.06.012
- Fukuyama, F. (1995). *Trust: Social Virtues and the Creation of Prosperity*. New York, NY: Free Press.
- Fukuyama, F. (2001). Social capital, civil society, and development. *Third World Q.* 22, 7–20.
- Galán, J. L., and Castro, I. (2004). Las relaciones interorganizativas como fuente de capital social. *Univ. Bus. Rev. (Second Quarter)* 2004, 104–117.
- Gargiulo, M., and Benassi, M. (2000). Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organ. Sci.* 11, 183–196. doi: 10.1287/orsc.11.2.183.12514
- Gu, Q., Wang, G. G., and Wang, L. (2013). Social capital and innovation in R&D teams: the mediating roles of psychological safety and learning from mistakes. *R&D Manag.* 43, 89–102.
- Hair, J. F., Ringle, C. M., and Sarstedt, M. (2013). Editorial-partial least squares structural equation modelling. rigorous applications, better results and higher acceptance. *Long Range Plan.* 46, 1–12. doi: 10.1016/j.lrp.2013.01.001
- Hayes, A. F., and Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis does method really matter? *Psychol. Sci.* 24, 1918–1927. doi: 10.1177/0956797613480187
- Horn, P., Scheffler, P., and Schiele, H. (2014). International integration as a precondition for external integration in global sourcing: a social capital perspective. *Int. J. Product. Econ.* 153, 54–65. doi: 10.1016/j.ijpe.2014.03.020
- Hsu, J. S. C., and Hung, Y. W. (2013). Exploring the interaction effects of social capital. *Inform. Manag.* 50, 415–430. doi: 10.1016/j.im.2013.06.001
- Inkpen, A. C., and Tsang, E. W. K. (2005). Social capital, networks and knowledge transfer. *Acad. Manag. Rev.* 30, 146–165. doi: 10.5465/amr.2005.15281445
- Jansen, J., Van Den Bosch, F., and Volterda, H. (2005). Managing potential and realized absorptive capacity: how do organizational antecedents matter? *Acad. Manag. J.* 48, 999–1015. doi: 10.5465/amj.2005.19573106
- Jensen, R. J., and Szulanski, G. (2007). Template use and the effectiveness of knowledge transfer. *Manag. Sci.* 53, 1716–1730. doi: 10.1287/mnsc.1070.0740
- Jiménez-Barrionuevo, M. M., García-Morales, V. J., and Molina, L. M. (2011). Validation of an instrument to measure absorptive capacity. *Technovation* 31, 190–202. doi: 10.1016/j.technovation.2010.12.002
- Landry, R., Amara, N., and Lamari, M. (2002). Does social capital determine innovation? To what extent? *Technol. Forecast. Soc. Change* 69, 681–701. doi: 10.1016/s0040-1625(01)00170-6
- Lane, P. J., Salk, J. E., and Lyles, M. A. (2001). Absorptive capacity, learning and performance in international joint ventures. *Strat. Manag. J.* 22, 1139–1161. doi: 10.1002/smj.206
- Leal-Rodríguez, A. L., Roldán, J. L., Ariza-Montes, J. A., and Leal-Millán, A. (2014). From potential absorptive capacity to innovation outcomes in project teams: the conditional mediating role of the realized absorptive capacity in a relational learning context. *Int. J. Project Manag.* 32, 894–907. doi: 10.1016/j.ijproman.2014.01.005
- Leenders, R. T. H. A. J., Van Engelen, J. M. L., and Kratzer, J. (2003). Virtuality, communication, and new product team creativity: a social network perspective. *J. Eng. Technol. Manag.* 20, 69–92. doi: 10.1016/s0923-4748(03)00005-5
- Leonard-Barton, D., and Sinha, D. K. (1993). Developer–user interaction and user satisfaction in internal technology transfer. *Acad. Manag. J.* 36, 1125–1139. doi: 10.2307/256649
- Lesser, E. L. (2000). Leveraging social capital in organizations. *Knowledge Soc. Cap.* 20, 3–16. doi: 10.1016/b978-0-7506-7222-1.50004-0
- Levin, D. Z., and Cross, R. (2004). The strength of weak ties you can trust: the mediating role of trust in effective knowledge transfer. *Manag. Sci.* 50, 1477–1490. doi: 10.1287/mnsc.1030.0136
- Limaj, E., and Bernroider, E. W. (2019). The roles of absorptive capacity and cultural balance for exploratory and exploitative innovation in SMEs. *J. Bus. Res.* 94, 137–153. doi: 10.1016/j.jbusres.2017.10.052
- Martín, G., López, P., Delgado, M., Andreeva, T., and Kianto, A. (2011). Knowledge processes, knowledge-intensity and innovation: a moderated mediation analysis. *J. Knowl. Manag.* 15, 1016–1034. doi: 10.1108/13673271111179343
- Martínez, R., Sáez, F. J., and Ruiz, P. (2012). Knowledge acquisition's mediation of social capital-firm innovation. *J. Knowl. Manag.* 16, 61–76. doi: 10.1108/13673271211198945
- Maurer, I., Bartsch, V., and Ebers, M. (2011). The value of intra-organizational social capital: how it fosters knowledge transfer, innovation performance, and growth. *Organ. Stud.* 32, 157–185. doi: 10.1177/0170840610394301
- Mayer, R. C., Davis, J. H., and Schoorman, F. D. (1995). An integrative model of organizational trust. *Acad. Manag. Rev.* 20, 709–734. doi: 10.5465/amr.1995.9508080335

- Máynez, A. I., Cavazos, J., Ibarreche, S., and Nuño, J. P. (2012). Identification of common factors in tacit knowledge transference within organizations. *Rev. Int. Administr. Finan.* 5, 103–117.
- McEvily, B., and Marcus, A. (2005). Embedded ties and the acquisition of competitive capabilities. *Strat. Manag. J.* 26, 1033–1055. doi: 10.1002/smj.484
- Molina, F. X., and Martínez, M. T. (2010). Social networks: effects of social capital on firm innovation. *J. Small Bus. Manag.* 48, 258–279. doi: 10.1111/j.1540-627x.2010.00294.x
- Moran, P. (2005). Structural Vs. relational embeddedness: social capital and managerial performance. *Strat. Manag. J.* 26, 1129–1151. doi: 10.1002/smj.486
- Moran, P., and Ghoshal, S. (1996). “Value creation by firms,” in *Academy of Management Best Paper Proceedings*, (Briarcliff Manor, NY: Academy of Management), 41–45.
- Mu, J., Peng, G., and Love, E. (2008). Interfirm networks, social capital, and knowledge flow. *J. Knowl. Manag.* 12, 86–100. doi: 10.1108/13673270810884273
- Murovec, N., and Prodan, I. (2009). Absorptive capacity, its determinants and influence on innovation output: cross-cultural validation of the structural model. *Technovation* 29, 859–872. doi: 10.1016/j.technovation.2009.05.010
- Nahapiet, J., and Ghoshal, S. (1998). Social Capital, intellectual capital and the organizational advantage. *Acad. Manag. Rev.* 23, 242–266. doi: 10.5465/amr.1998.533225
- Naqshbandi, M. M., and Kamel, Y. (2017). Intervening role of realized absorptive capacity in organizational culture–open innovation relationship: evidence from an emerging market. *J. Gen. Manag.* 42, 5–20. doi: 10.1177/0306307016687984
- Nitzl, C., Roldan, J. L., and Cepeda, G. (2016). Mediation analysis in partial least squares path modelling: helping researchers discuss more sophisticated models. *Industr. Manag. Data Syst.* 116, 1849–1864. doi: 10.1108/imds-07-2015-0302
- Nunnally, J. (1978). *Psychometric Methods*. New York, NY: McGraw-Hill.
- Ojo, A. O., Raman, M., and Chong, C. W. (2017). Microlevel antecedents of absorptive capacity in joint project engineering teams. *Manag. Res. Rev.* 40, 990–1006. doi: 10.1108/mrr-08-2016-0202
- Ortiz, B., Donate, M., and Guadamillas, F. (2017). Relationships between structural social capital, knowledge identification capability and external knowledge acquisition. *Eur. J. Manag. Bus. Econ.* 26, 48–66. doi: 10.1108/ejmb-07-2017-004
- Ortiz, B., Donate, M., and Guadamillas, F. (2018). Inter-organizational social capital as an antecedent of a firm's knowledge identification capability and external knowledge acquisition. *J. Knowl. Manag.* 22, 1332–1357.
- Peeters, C., Massini, S., and Lewin, A. Y. (2014). Sources of variation in the efficiency of adopting management innovation: the role of absorptive capacity routines, managerial attention and organizational legitimacy. *Organ. Sci.* 9, 1343–1371. doi: 10.1177/0170840614539311
- Podsakoff, P. M., and Organ, D. W. (1986). Self-reports in organizational research: problems and prospects. *J. Manag.* 12, 531–544. doi: 10.1177/014920638601200408
- Putman, R. D. (1993). The prosperous community: social capital and economic growth. *Am. Prospect* 13, 35–42.
- Rodrigo-Alarcón, J., Parra-Requena, G., and Ruiz-Ortega, M. J. (2020). Cognitive social capital and absorptive capacity as antecedents of entrepreneurial orientation: a configurational approach. *Eurasian Bus. Rev.* 10, 493–517. doi: 10.1007/s40821-020-00169-3
- Salas-Vallina, A., Ferrer-Franco, A., and Herrera, J. (2020). Fostering the healthcare workforce during the COVID-19 pandemic: shared leadership, social capital, and contagion among health professionals. *Int. J. Health Plan. Manag.* 35, 1606–1610. doi: 10.1002/hpm.3035
- Sánchez-Famoso, V., Maseda, A., and Iturralde, T. (2017). Family involvement in top management team: Impact on relationships between internal social capital and innovation. *J. Manag. Organ.* 23, 136–162. doi: 10.1017/jmo.2016.2
- Schilling, M. (2019). *Strategic Management of Technological Innovation*, 6th Edn. New York, NY: McGraw-Hill.
- Schoorman, F. D., Mayer, R. C., and Davis, J. H. (2007). An integrative model of organizational trust: Past, present, and future. *Acad. Manag. Rev.* 32, 344–354. doi: 10.5465/amr.2007.24348410
- Selivanovskikh, L., Latukha, M., Mitskevich, E., and Pitinov, S. (2020). Knowledge management practices as a source of a firm's potential and realized absorptive capacity. *J. East West Bus.* 26, 1–33.
- Shi, Y., and Guan, J. (2016). Small-world network effects on innovation: evidences from nanotechnology patenting. *J. Nanopar. Res.* 18:329.
- Škerlavaj, M., Hoon Song, J., and Lee, Y. (2010). Organizational Learning culture, innovative culture and innovations in South Korean firms. *Exp. Syst. Appl.* 37, 6390–6403. doi: 10.1016/j.eswa.2010.02.080
- Smith, K. G., Collins, C. h. J., and Clark, K. D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. *Acad. Manag. J.* 48, 346–357. doi: 10.5465/amj.2005.16928421
- Teece, D. J., Pisano, G., and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strat. Manag. J.* 18, 509–533. doi: 10.1002/(sici)1097-0266(199708)18:7<509::aid-smj882>3.0.co;2-z
- Todorova, G., and Durisin, B. (2007). Absorptive capacity: valuing a reconceptualization. *Acad. Manag. Rev.* 32, 774–786. doi: 10.5465/amr.2007.25275513
- Tsai, W., and Ghoshal, S. (1998). Social capital and value creation: the role of intrafirm networks. *Acad. Manag. J.* 41, 464–476. doi: 10.5465/257085
- Upadhyayula, R. S., and Kumar, R. (2004). “Social capital as an antecedent of absorptive capacity of firms,” in *Proceedings of the DRUID Summer Conference 2004 on Industrial Dynamics, Innovation and Development*, Elsinore.
- Uzzi, B. (1999). Embeddedness in the making of financial capital: how social relations and networks benefit firms seeking financing. *Am. Sociol. Rev.* 64, 481–505. doi: 10.2307/2657252
- Wang, C. L., and Ahmed, P. K. (2007). Dynamic capabilities: a review and research agenda. *Int. J. Manag. Rev.* 9, 31–51. doi: 10.1111/j.1468-2370.2007.00201.x
- Wang, S., Guidice, R., and Zhou, Y. (2017). It's more complicated than we think: the implications of social capital on innovation. *Asia Pac. J. Manag.* 34, 649–674. doi: 10.1007/s10490-016-9491-y
- Wang, Z., Ling, J., and Chok, J. I. (2020). Relational embeddedness and disruptive innovations: the mediating role of absorptive capacity. *J. Eng. Technol. Manag.* 57, 101–587.
- Wold, H. O. A. (1985). “Systems analysis by partial least squares,” in *Measuring the Unmeasurable*, eds P. Nijkamp, H. Leitner, and N. Wrigley (Dordrecht: Martinus Nijhoff), 221–251. doi: 10.1007/978-94-009-5079-5_11
- Wu, W. P. (2008). Dimensions of social capital and firm competitiveness improvement: the mediating role of information sharing. *J. Manag. Stud.* 45, 122–146.
- Xie, X., Zou, H., and Qi, G. (2018). Knowledge absorptive capacity and innovation performance in high-tech companies: a multi-mediating analysis. *J. Bus. Res.* 88, 289–297. doi: 10.1016/j.jbusres.2018.01.019
- Yan, Y., and Guan, J. (2018). Social capital, exploitative and exploratory innovations: the mediating roles of ego-network dynamics. *Technol. Forecast. Soc. Change* 126, 244–258. doi: 10.1016/j.techfore.2017.09.004
- Yeşil, S., and Doğan, I. F. (2019). Exploring the relationship between social capital, innovation capability and innovation. *Innovation* 21, 506–532. doi: 10.1080/14479338.2019.1585187
- Yu, S. H. (2013). Social capital, absorptive capacity, and firm innovation. *Technol. Forecast. Soc. Change* 80, 1261–1270. doi: 10.1016/j.techfore.2012.12.005
- Zahra, S. A., and George, G. (2002). Absorptive capacity: a review, reconceptualization and extension. *Acad. Manag. Rev.* 27, 185–203.
- Zheng, W. (2010). A social capital perspective of innovation from individuals to nations: where is empirical literature directing us? *Int. J. Manag. Rev.* 12, 151–183.
- Zollo, M., and Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organ. Sci.* 13, 339–351.

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APPENDIX

Appendix Research Items.

Constr.	Dimensions	My firm usually. . . (From 1 –strongly disagree to 7-strongly agree)
INTERNAL SOCIAL CAPITAL (INT_SC)	STRUCTURAL SOCIAL CAPITAL (INT_SSC)	Has employees who are very close to each other Has employees with a high level of communication with each other Has employees who enjoy spending time together Encourages its employees to have frequent contacts through, formal (e.g., corporate directory, meetings) and informal means (e.g., outdoor activities) (In general) Has employees who maintain relationships with each other
	RELATIONAL SOCIAL CAPITAL (INT_RSC)	(In general) Has employees with good intentions Has honest and trusted employees Has faultless employees Has totally confidence in its employees
	COGNITIVE SOCIAL CAPITAL (INT_CSC)	Has employees who are aware that pursuing a common organizational objective and mission is essential Fosters teamwork Fosters the open discussion of problems Fosters abilities such as creativity and flexibility Provides our employees with resources and time for learning and sharing.
REALIZED ABSORPTIVE CAPACITY (R_AC)	ASSIMILATION/TRANSFORMATION	Considers the consequences of changes in the market in order to create new products and services Uses ICT for registration and storage of new knowledge for future reference Recognizes the usefulness of new external knowledge and of incorporating it with existing knowledge quickly Establishes regular meetings to discuss the consequences of market trends and the development of new services Has tools/techniques for distributing and sharing knowledge
	EXPLOITATION	Studies which is the best way to exploit knowledge Knows which area (department, employees) can best exploit new knowledge Hardly ever uses new knowledge in new products*
PRODUCT INNOVATION (PROD_INN)		Has introduced more innovative products/services compared to its competitors Has frequently emphasized the development of new patented products Has satisfied the market through the speedy development of its products Has continuously changed product design to enter more quickly in new emerging markets Has continuously improved the components and quality of its products

*Item with inverse coding.



e-Banking Adoption: An Opportunity for Customer Value Co-creation

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The development of information and communication technologies offers innovative opportunities to establish business strategies focused on customer value co-creation. This situation is especially notable in the banking industry. e-Banking activities can support competitive advantages. However, the adoption of e-banking is not yet well-established among consumers. In this sense, the technology acceptance model (TAM) is considered essential in studying consumer behavior applied to adopt a particular technology. According to the TAM model, this study analyses the factors which influence bank customers to adopt e-banking to facilitate their banking services and support the process of value co-creation. Consequently, the authors examine five main aspects of the technology adoption model to provide a broad understanding of bank customers' consumption of e-banking. A partial least squares structural equation modeling (PLS-SEM) analysis is conducted to evaluate proposed relationships between factors and customers' e-banking adoption.

Keywords: customer value co-creation, e-banking, e-services, technology acceptance model, PLS-SEM

INTRODUCTION

The rapid growth and development of information and communication technologies (ICT) have enabled companies to create value in a digital environment (Schrieck and Wiesche, 2017). Currently, the adoption of innovation in the organization's strategy is an essential requirement to create value. The term value co-creation has a principal role in easing this innovation. O'Hern and Rindfleisch (2010) conceptualize value co-creation as a collaborative activity, in which consumers actively participate and choose components of a different product or service proposition. Thus, in the digital era, value creation has become the co-creation of value between customers and companies (Hosseini et al., 2020).

Internet and technological development have changed how financial services are offered and used (Malaquias and Hwang, 2019). Banks and many financial institutions suggest alternative innovative electronic channels for maintaining a competitive advantage and satisfying customer expectations. Mobile devices and destock have increasingly become tools that customers implement through e-banking to pay for products and services (Zhang et al., 2018). Therefore, e-banking can adapt to clients' needs, such as performing banking activities, without physically visit an office or an ATM (Malaquias and Hwang, 2019). For this reason, e-banking has considerable value for many financial organizations and customers (Baabdullah et al., 2019).

The introduction and growth of Internet services, which offer better possibilities of interaction with companies, allow consumers to participate in the development and/or improvement of products/services, resulting in value. Consequently, organizations are concerned about attracting

customers who want to contribute their ideas to the collaborative process (Chepurna and Criado, 2018). The banking context is particularly interesting in analyzing the transition toward a value co-creation strategy (Mostafa, 2020). The fierce competition in the banking arena has facilitated e-banking as the most cutting-edge electronic-based and self-service distribution channel (Malaquias and Hwang, 2019). e-Banking is conceptualized as a distribution and communication channel which allows customers to interact with a bank to conduct transactions economically and efficiently, mainly through electronic tools, e.g., tablets or smartphones (Singh and Srivastava, 2020). The use of e-banking offers a wide variety of services for customers, which provide them with value and create a competitive advantage over competitors, such as account checking, bill payment, transferes, or mobile phone text message notifications (Mostafa, 2020). As an example of this incremental service innovations, Bankia is modernizing their communication channels to increase the value offered to customers. Bankia has been recognized as the first Spanish bank with an official verified WhatsApp account to communicate with either current customers or prospects. This action is part of its business strategy “Digital Humanism” as a new way of relating to customers based on a closer, agile, and direct actions (Bankia, 2020).

The massive usage of the Internet and electronic gadgets have captured the attention of researchers to e-banking. Previous studies (e.g., Glavee-Geo et al., 2017; Singh and Srivastava, 2020) show that previous works have studied the factors that encourage the adoption of e-banking (Mostafa, 2020). However, the adoption rate of e-banking is below the expectation and still in the adoption phase, even though e-banking services offer several outstanding services to users (Shankar et al., 2020). Therefore, this study aims to develop an empirical model based on technology adoption, applied in e-banking to understand the behavior of the users. Specifically, some variables included in the technology acceptance model (TAM) will be examined as factors that stimulate the adoption of e-banking and become an opportunity for customer value co-creation.

For this reason, this research provides a series of contributions that can help identify decisive factors in the use of e-banking and encourage customer value co-creation through interaction with electronic services. In this setting, this study focuses on the following questions: What are the factors that affect a consumer's use of e-banking? What factors are most important in the consumer's intention to use e-banking? What type of e-banking is most in-demand, and what strategies around the use of e-banking could the banks and financial institutions follow to increase its use? How can the use of e-banking contribute to customer value co-creation? Through partial least squares structural equation modeling (PLS-SEM) approach and the use of the importance-performance map analysis (IPMA), this research field provides insights and recommendations to help the banking industry adopt and use e-services by consumers to support the process of value co-creation.

To achieve the proposed objective, the study is organized as follows. First, the conceptual framework, the proposed model, and its hypotheses are presented. Then, the methods used and

the results of the study are described. Finally, the conclusions and limitations of the study are presented.

CONCEPTUAL FRAMEWORK

Co-creation and the Banking Market

The banking industry is a leader in providing consumers with opportunities to access products and services through advanced technology (Malar et al., 2019). The development of ICT has allowed banks to have a relationship with customers, shifting away from physical interaction with a bank branch to interactive and virtual environments (Martovoy and Santos, 2012). Some authors, such as Andreu et al. (2010), specify the consequences of direct interactions between a company and its customers to achieve value co-creation. Other researchers, such as Payne et al. (2008), highlight that organizations must adopt a customer relationship approach to support value creation. Co-creation requires companies' ability to connect with customers and market orientation to be closer to them (Ind and Coates, 2013). Consequently, the company-client relationship must be active, providing interactive experiences and activities guided by decisive practices while taking advantage of customers' unconscious behavior. In this sense, customers are encouraged to participate in the process and meet their own needs.

Following the study of Grönroos (2011), consumers ought to perceive usefulness or benefit using self-service and involvement in the process to be motivated. In the banking sector, there is a generalized interest in providing easy and fast services, maintaining the quality of products, and services toward the customer. Furthermore, the advent of new technologies, products, and services encourages new needs and demands by customers (Hosseini et al., 2020). Ease access to information and the differentiation of products and services offered by the Internet creates higher expectations among customers. Consequently, an innovation that appears in a specific part of the work may be effortlessly accessed in other parts of the world and desired by any person (Mainardes et al., 2017). Another feature of electronic services is accessibility to consumers. Some studies indicate that banking services are linked to this new and demanding customer profile. Consequently, the new services provided by banks arise from customers' needs, characterizing the continuous sharing of ideas and value co-creation in the banking sector (Oliveira and von Hippel, 2011; Akter et al., 2020).

Based on the study of Medberg and Heinonen (2014), direct contact with the company and e-services create new ways of relationship and involvement with customers, positively affecting the company's financial performance (e.g., decreasing of operating costs, increase on investment return). Furthermore, this way of interacting with customers has boost competitiveness in the banking industry, requiring an agile adaptation from each financial organization. It is proven that, when a bank includes a new or enhanced service to customers, competitors follow this innovation through the launch of the same or improved service. Thus, co-creation characterizes the innovation and betterment of services provided by banks. This fact encourages customers' active participation in the co-creation practice through several

benefits: easier credit approval, lower charges, or commitment to the bank (Mostafa, 2020). Hence, value co-creation should drive to reciprocally favorable outcomes for both consumers and businesses.

Adoption of Technology and e-Services Banking

In recent years, the development of Information Technology and the Internet has brought about changes in the performance of traditional services. Thus, e-banking has changed the conventional practices of banks and financial institutions and has captured the attention of both academics and practitioners (Wang et al., 2017). The adoption of e-banking is considered an innovative distribution channel for financial services due to rapid advances in e-banking applications and intense competence (Sikdar et al., 2015; Yaseen and El Qirem, 2018). Thus, understanding the adoption and use of e-banking has become a central research field. The literature indicates that the most relevant strength of the TAM, developed by Davis et al. (1989), is its generalizability and applicability in different contexts (Yaseen and El Qirem, 2018). This model is specifically indicated to study the intention to adopt specific technologies. Thus, the TAM applies models to study the acceptance and intention to use information system tools such as mobile commerce (e.g., Natarajan et al., 2018), m-banking (e.g., Mostafa, 2020; Shankar et al., 2020) and e-banking (Yoon and Steege, 2013; Salimon et al., 2017; Yaseen and El Qirem, 2018; Ahmad et al., 2019), among others. The original TAM considers perceived usefulness and perceived ease of use has a significant role in the technology acceptance process (Davis et al., 1989). On one side, perceived ease of use is defined as the degree to which a person believes that using a particular system is effortless, both physically and mentally. On the other side, perceived utility is described as the degree to which consumers believe that using a system will increase their performance (Davis et al., 1989; Mostafa, 2020). Some previous studies in technology acceptance demonstrate that perceived ease of use has a positive effect, mediated by perceived usefulness on the intention to use technology (Natarajan et al., 2018).

In the context of e-banking, it is observed that perceived usefulness represents one of the critical aspects that explain behavior intention to use e-banking (Malaquias and Hwang, 2019). For example, e-banking provides some unique services that are not available in offline banking, such as access to banking services at any time and from anywhere (Yoon and Steege, 2013; Shankar and Jebarajakirthy, 2019). Similarly, previous studies show the influence of perceived ease of using e-banking on perceived usefulness and attitude (e.g., Deb and Lomo-David, 2014). Internet and mobile technology should improve convenience for customers, and its ease of use is critical in customer usage. Some authors (e.g., Riquelme and Rios, 2010) claim that adopting mobile banking is influenced by consumer's perceived ease of use due to a complex system when it performs financial transactions. In this sense, the authors highlight that if consumers perceive the performance of a financial transaction as easy through mobile devices, they will have a more favorable

attitude toward adopting mobile banking (Zhang et al., 2018). Ahmad et al. (2019) argue that a client's beliefs about the usability of the website or application affect his or her attitude toward the website or application. These authors state that the ease of use of e-banking systems is a critical factor in their adoption and evaluation by clients. Thus, the relationship between consumers' attitudes toward the use of technology, an excellent example of this is e-banking, and perceived ease of use is studied (e.g., Zhang et al., 2018). Moreover, Mostafa (2020) argues that customers may negatively evaluate using e-banking if they believe e-banking technology is challenging to use and learn. Thus, the following hypotheses are proposed:

H1. Perceived ease of use positively influences on perceived usefulness of e-banking.

H2. Perceived ease of use positively influences on attitude toward using e-banking.

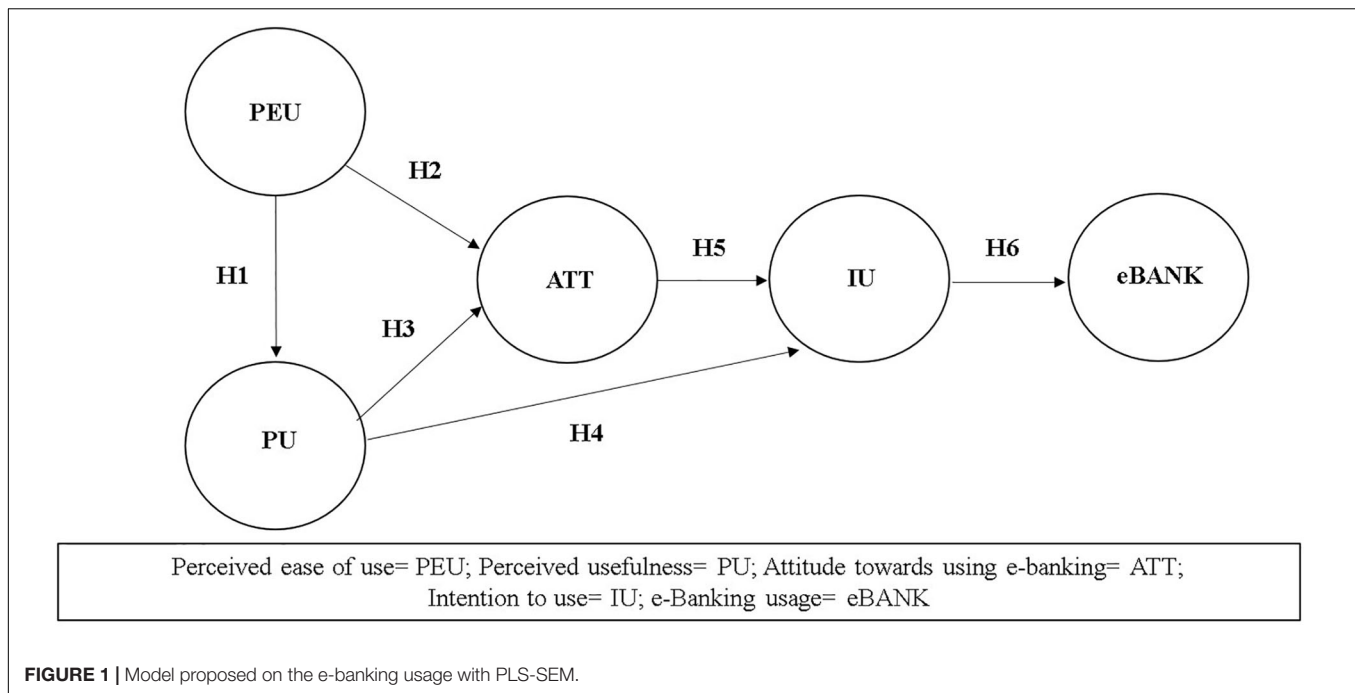
Another dimension included in the TAM model is the perceived usefulness. This concept and its role have been examined in e-banking works (e.g., Yoon and Steege, 2013; Salimon et al., 2017; Malaquias and Hwang, 2019). Perceived usefulness can be defined as a person's belief about if the use of a specific technology will improve their task performance (Davis et al., 1989; Natarajan et al., 2018). Authors such as Yoon and Steege (2013) state that perceived utility is a positive and determining element in e-banking usage. Similarly, this term is the principal factor that impacts consumers' attitudes toward the use of technology (Deb and Lomo-David, 2014). Consequently, customers will evaluate e-banking usage favorably if they perceive that e-banking has a relative advantage over other alternatives (Mostafa, 2020). Recently, authors such as Ahmad et al. (2019) have highlighted the positive relationship of perceived usefulness with both attitudes toward using e-banking and user intention. According to the previous statements, the following hypotheses are formulated:

H3. Perceived usefulness positively influences on attitude toward using e-banking.

H4. Perceived usefulness positively influences on intention to use e-banking.

The concept of attitude toward the behavior reflects the degree to which an individual assesses a specific behavior as useful or not (Ajzen, 1991). Venkatesh et al. (2003) interpret attitudes toward a specific innovation as results of an individual's own beliefs about an objective and the evaluations associated with those beliefs. In TAM's scope, positive attitudes toward innovative technologies have confirmed antecedents of intentions to adopt them (Davis et al., 1989; Schierz et al., 2010). The association among attitude and intention to use has been broadly examined in the literature, particularly in the banking literature (e.g., Shaikh and Karjalainen, 2015; Zhang et al., 2018; Ahmad et al., 2019; Mostafa, 2020).

Similarly, past research shows that attitude is an essential determinant of behavioral intention and a relevant antecedent of actual behavior. Consequently, the intention to adopt has been analyzed to understand people's actual behavior (Davis



et al., 1989; Zhang et al., 2018). Yaseen and El Qirem (2018) conceptualize behavior intention to adopt e-banking services as a measure of the strength of an individual's intention to perform a specific behavior. Also, authors such as Ahmad et al. (2019) explain behavioral intention to use e-banking as a precedent to the actual use of e-banking. Based on prior studies, the following hypotheses are proposed:

H5. Attitude toward using e-banking positively influences on intention to use e-banking.

H6. Intention to use e-banking positively influences on e-banking usage.

Based on the above, **Figure 1** summarizes the hypotheses of the proposed conceptual model.

MATERIALS AND METHODS

Study Design

To test the proposed hypotheses, the authors carried out a study in Southern Europe's banking industry. Specifically, the research was conducted in Spain due to the recent increase in e-banking in this country. e-Banking has experienced a growing acceptance in Spain in recent years, with more than 50% of digital banking population users. Some figures indicate that the number of Spain's e-banking users increased to 28% between 2011 and 2019 (Statista, 2020a). Santander Group ranked first with more than 36 million digital customers during 2019, followed by BBVA with 31 million (Statista, 2020b).

A convenience sampling method was used to collect the data, taking e-banking users' opinions as reference. A convenience sampling method was used to collect the data, taking e-banking

users' opinions as reference. Data was collected via an online survey from February to April 2020. Potential respondents in Spain were recruited through a national consumer panel. To measure each of the constructs, a self-administered survey has been used to analyze the e-banking usage of a set of well-known banks located in Spain. The application of PLS-SEM requires a minimum sample size. For this purpose, the statistical power is analyzed using G*Power 3.1.9.7 (Carranza et al., 2020). Thus, the statistical power value for this sample considering a medium effect size ($f^2 = 0.15$) is 0.989, higher than the established minimum of 0.8 (Cohen, 1988; Hair et al., 2019). Of 105 e-banking users (see **Table 1**), 45.7% of the sample collected is composed of men and 54.3% of women. Concerning age, the largest group is integrated by individuals between 24 and 33 years old, representing 32.4% of the sample. In addition, the accumulated percentage of consumers up to 43 years of age is 67.6%. Hence, the sample is predominantly made up of young adults and mid-aged e-banking users. Thus, this study coincides with previous studies in e-banking such as Zhang et al. (2018), Malaquias and Hwang (2019), Mostafa (2020), Singh and Srivastava (2020), where the samples are mostly composed of young people considered more likely to use digital technologies and media. Moreover, 35.3% of the respondents are employees, 43.8% are singles, and 37.1% are married. Concerning consumption factors, 93.3% of the sample uses e-banking to check their bank account balance, 49.5% make bank transfers through e-banking, and 15.2% manage invoices and taxes.

Measures

In order to measure the constructs included in this study and examine the proposed relationships, a structured questionnaire was used. Firstly, questions related to the frequency and habits

TABLE 1 | Characteristics of the survey sample.

Customer profile	Categories	Sample (percentage)
Gender	Men	45.7
	Woman	54.3
Age	≥23	17.1
	24–33	32.4
	34–43	18.1
	44–53	14.3
	54–63	9.5
	+64	8.6
Occupation	Student	21.9
	Employed person	35.3
	Self-employed person	19.0
	Retired person	10.5
	Unemployed	11.4
Civil status	Other	1.9
	Single	43.8
	Married	37.1
	Living as a couple	10.5
	Separated or divorced	5.7
	Other	2.9

of the use of electronic banking were included. Then, the variables associated with the attitude and behavior toward using e-banking were exposed. All these constructs were evaluated with multi-item scales confirmed by previous studies, using a Likert scale ranging from 1 to 5, except the construct intended to use, presented on a semantic differential scale (see **Table 2**). Thus, variables for perceived ease of use were based on Davis et al. (1989) and Venkatesh et al. (2003). The attitude toward using e-banking was measured through a semantic differential scale using six items (five bipolar pairs of adjectives). Several authors, such as Stern and Salb (2015), define the attitude as a formative construct characterized mainly by affective aspects and instrumental distinctions. According to the scales proposed by Davis et al. (1989), Venkatesh et al. (2003), and Carranza et al. (2020) in the area of technology acceptance, the attitude variable was measured using three significant items (unpleasant-attractive, unsatisfactory-satisfactory, boring-fun) and three instrumental items (bad-good, uninteresting-appealing, harmful-beneficial).

The perceived usefulness was measured using the Agarwal and Karahanna (2000) scale, following Mostafa's (2020) work. Intention to use was measured using a single-item scale based on previous research, such as Bigné et al. (2008). Three items adapted from Davis et al. (1989) and Dutot (2015) were used to measure e-banking usage. The last section of the questionnaire aims to collect information on the socio-demographic profile of e-banking users, such as gender, age, or occupation.

Statistical Analysis

The model was estimated using PLS-SEM. PLS-SEM is a technique of structural equation models based on variance. In this study, the use of PLS-SEM is recommended because (1) the study

TABLE 2 | Measurement of key concepts.

Construct	Adapted items	Scale origin
Perceived ease of use (PEU)	PEU1: I find using e-banking easy.	Adaptation of Davis et al. (1989); Venkatesh et al. (2003)
	PEU2: I use e-banking without any help.	
	PEU3: I use e-banking without any problem.	
	PEU4: I consider myself an expert in the use of e-banking.	
	PEU5: Using e-banking does not require a tremendous mental effort.	
	PEU6: In general, I think it is easy to use e-banking.	
Perceived usefulness (PU)	PU1: Using e-banking enhances my effectiveness in living and working.	Adaptation of Agarwal and Karahanna (2000); Mostafa (2020)
	PU2: Using e-banking enhances my productivity.	
	PU3: I find e-banking useful in my living and working activities.	
	PU4: Using e-banking improves my performance in living and working.	
	PU5: In general, using e-banking is very useful.	
Attitude toward using e-banking (ATT)	ATT1: Bad – good	Adaptation of Davis et al. (1989); Venkatesh et al. (2003)
	ATT2: Uninteresting – appealing	
	ATT3: Harmful – beneficial	
	ATT4: Unpleasant – attractive	
	ATT5: Unsatisfactory – satisfactory	
	ATT6: Boring – fun	
Intention to use (IU)	IU1: Will you use e-banking in the next 3 months? 1. No, definitely not 2. Probably not 3. Indifferent 4. Yes, probably 5. Yes definitely	Adaptation of Bigné et al. (2008)
e-Banking usage (eBANK)	eBANK1: I have no problem with the use of e-banking.	Adaptation of Davis et al. (1989); Dutot (2015)
	eBANK2: No one influences my decision to use e-banking.	
	eBANK3: I have enough experience with new technologies to use e-banking.	

includes a formative construct (attitude toward using e-banking), (2) the model uses composite models (Hair et al., 2019), and (3) PLS-SEM is applied in recent studies of TAM, in the field of e-banking, as well as in other different areas (e.g., Salimon et al., 2017; Carranza et al., 2020; Zollo et al., 2020). To estimate the proposed model, SmartPLS 3.2.9 was used. According to Hair et al. (2019), a two-stage approach is used to evaluate the proposed model in this e-banking customers' context. Thus, the measurement model is evaluated distinguishing the variables

considered as a composite model in Mode A and Mode B, and then, the structural model is assessed.

RESULTS

Measurement Model

First, the standardized root mean square residual (SRMR) of the proposed model is calculated in order to assess the model fit (Henseler et al., 2016). In this case, the SRMR value is 0.070, indicate an appropriate fit, given the accepted 0.008 cut-off point. To evaluate the measurement model, the reliability of the scales is studied for the construct's perceived ease of use, perceived usefulness, intention to use, and e-banking usage (Mode A). Thus, the loadings of the indicators are examined, all of which are higher than 0.708. The evaluation of individual reliability is examined through the Dijkstra–Henseler's rho (ρ_A) and the composite reliability (CR) being higher than 0.7 in all cases (Hair et al., 2019). Therefore, all the variables included in the model reflect high internal consistency (see **Table 3**). Then, the average variance extracted (AVE) is used to evaluate convergent validity. In this case, all values of the AVE are within the established thresholds limits (Fornell and Larcker, 1981). Lastly, all loadings are significant at 99.9% (Hair et al., 2017). Concerning the analysis of the discriminant validity, the results obtained by the Fornell–Larcker criterion show a satisfactory degree of discriminant validity. However, Henseler et al. (2015) suggest construct thresholds below 0.9 for HTMT to establish discriminant validity. In this case, problems of discriminant validity between PEU and PU are detected. For that reason, the items causing the problem are studied and eliminated (see **Table 4**).

To evaluate the validity of the attitude toward using e-banking, the variance inflation factor (VIF) is used to assess the lack of

collinearity problems by the indicators ($VIF < 5$) (see **Table 5**). Finally, for the significance value of the weights, ATT4 and ATT6 are not significant. However, according to Hair et al. (2019), since there are no collinearity problems and the loads are greater than 0.5, these indicators are not deleted.

Structural Model

After checking the reliability and validity of the measurement model, the proposed structural model is examined. To do this, the explanatory capacity of the model is evaluated using R^2 (Hair et al., 2019). The R^2 values are 0.657 for perceived usefulness, 0.530 for attitude toward using e-banking, 0.462 for intention to use, and 0.324 for e-banking usage. After performing an analysis of the variance decomposition, the findings confirm that, of the 53% of the explained variance of attitude toward using e-banking, 29.1% is due to perceived ease of use and 23.9% to perceived usefulness. Similarly, of the 46.2% of explained variance of intention to use, 14.4% is due to perceived usefulness, and 31.8% is due to attitude toward using e-banking. Even though these results confirm significant relationships, the influence of consumers' attitudes toward the intention to use e-banking is greater than the contribution of the perceived usefulness.

On the other hand, the path coefficients and their significance are evaluated to describe the significance of the structural relationships proposed in the model (see **Table 6**). Perceived ease of use appears to be positive and significant, at 99.9% in perceived usefulness. Thus, H1 is supported, being the most solid association of the model ($\beta = 0.811$). As proposed in H2 and H3, perceived ease of use and perceived usefulness are positively associated with the attitude toward using e-banking ($\beta = 0.417$ and 0.348, respectively). Similarly, perceived usefulness has a significant influence on the intention to use of e-banking, also confirming H4 ($\beta = 0.248$). Also, attitude toward using e-banking, in general, has a significant and positive effect on the intention to use e-banking. Thus, H5 is established ($\beta = 0.485$). Finally, the intention to use has a significant influence on e-banking usage. Therefore, H6 is also confirmed ($\beta = 0.569$) (Hair et al., 2019). Thus, hypotheses H1, H2, H3, H4, H5, and H6 are accepted by the percentile method.

After evaluating and confirming the proposed model, the effect size is evaluated (Hair et al., 2019). Thus, the results show

TABLE 3 | Measurement model evaluation.

Construct/associated items	Loading	Dijkstra–Henseler's rho (ρ_A)	CR	AVE
PEU (Mode A)				
PEU2	0.924***	0.906	0.937	0.831
PEU4	0.912***			
PEU5	0.899***			
PU (Mode A)				
PU1	0.916***	0.900	0.936	0.831
PU3	0.923***			
PU4	0.895***			
IU (Mode A)				
IU1	1.000***	1.000	1.000	1.000
eBANK (Mode A)				
eBANK1	0.918***	0.934	0.926	0.807
eBANK2	0.852***			
eBANK3	0.923***			

n = 5,000 subsample: *** $p < 0.001$ (one-tailed *t* Student). CR, composite reliability; AVE, average variance extracted; PEU, perceived ease of use; PU, perceived usefulness; IU, intention to use; eBANK, e-banking usage.

TABLE 4 | Measurement model: discriminant validity.

	Fornell–Larcker criterion				HTMT			
	EU	PU	IU	eBANK	PEU	PU	IU	eBANK
PEU	0.912				EU			
PU	0.811	0.912			PU	0.898		
IU	0.578	0.581	1.000		IU	0.604	0.613	
eBANK	0.792	0.777	0.569	0.898	eBANK	0.858	0.851	0.584

PEU, perceived ease of use; PU, perceived usefulness; IU, intention to use; eBANK, e-banking usage; AVE, average variance extracted. Fornell–Larcker criterion: diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (average variance extracted). Off-diagonal elements should be larger than off-diagonal elements.

TABLE 5 | Measurement model: model composite Mode B.

					Weights bootstrapping		Collinearity statistic
Constructs	Loading	Weights	t	Sig	5%	95%	VIF
Attitude toward using e-banking (Mode B)							
ATT1	0.879	0.524**	2.787	0.003	0.175	0.794	2.040
ATT2	0.864	0.317*	1.814	0.035	0.003	0.583	3.535
ATT3	0.541	0.237*	1.844	0.033	−0.455	−0.035	1.927
ATT4	0.795	0.065 ^(ns)	0.414	0.339	0.166	0.352	3.154
ATT5	0.856	0.298*	1.839	0.033	0.010	0.548	4.002
ATT6	0.764	0.113 ^(ns)	0.816	0.207	0.117	0.345	2.719

n = 5,000 subsample: ***p* < 0.01; **p* < 0.05; *ns*, non-significant (one-tailed *t* Student).

TABLE 6 | Structural model evaluation.

	β	<i>T</i>	Confidence interval (95%)	VARIANCE EXPLAINED (R^2)		PREDICTIVE RELEVANCE (Q^2)	Effect size (f^2)	VIF
				R^2	Adjusted R^2			
PEUPU	0.811***	1.267	(0.744; 0.868) Sig.	0.657	0.654	0.539	1.915	1.000
PEUATT	0.417**	2.372	(0.128; 0.702) Sig.				0.127	2.915
PUATT	0.348*	1.687	(0.011; 0.684) Sig.	0.530	0.521	0.307	0.088	2.915
PUIU	0.248**	2.663	(0.060; 0.365) Sig.				0.061	1.888
ATTIU	0.485***	4.866	(0.350; 0.678) Sig.	0.462	0.452	0.390	0.232	1.888
IUeBANK	0.569***	9.733	(0.475; 0.667) Sig.	0.324	0.317	0.243	0.479	1.000

n = 5,000 subsample: ****p* < 0.001; ***p* < 0.01; **p* < 0.05 (one-tailed *t* Student). PEU, perceived ease of use; PU, perceived usefulness; ATT, attitude toward using e-banking; IU, intention to use; eBANK, e-banking usage.

that (see **Table 6**), the perceived ease of use has a large effect size on perceived usefulness ($f^2 = 1.915$). Likewise, the intention to use has a significant and large effect size on e-banking usage ($f^2 = 0.479$). Finally, the model's predictive relevance is analyzed. In this case, Stone–Geisser's Q^2 shows that the scores are higher than naught (see **Table 6**).

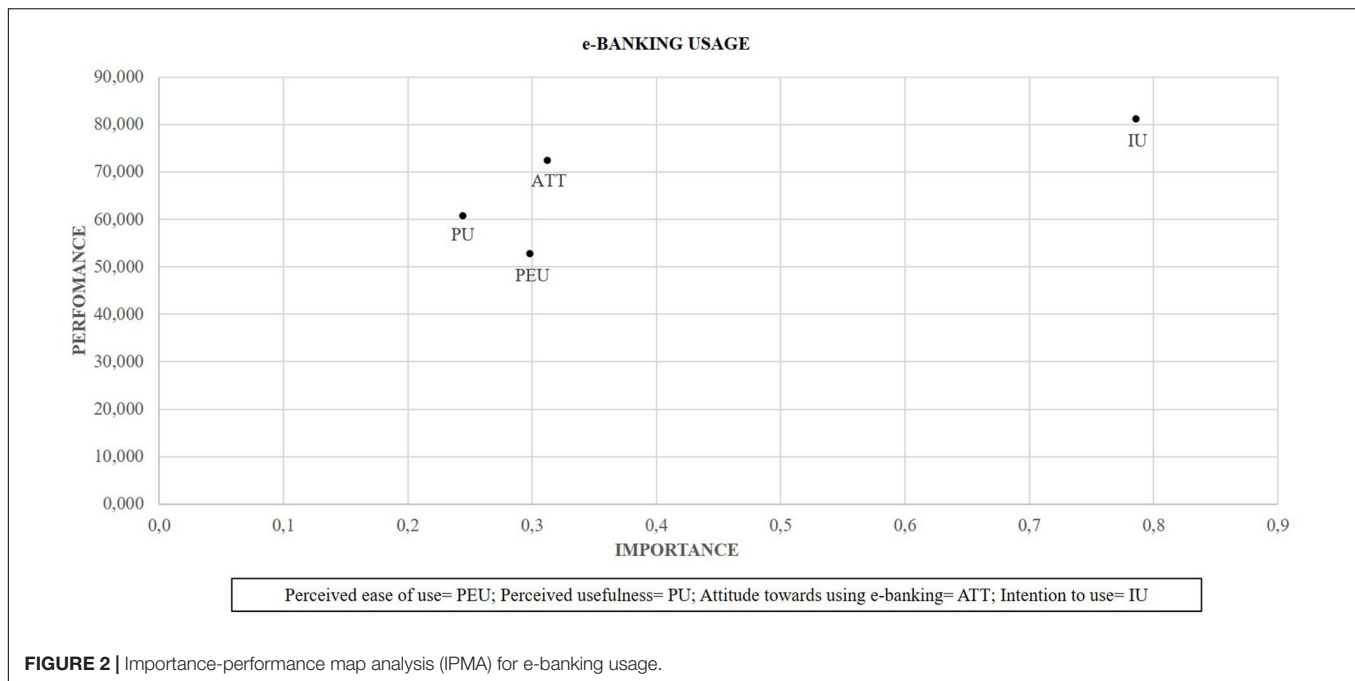
To improve these results, the IPMA is used. The IPMA expands the reported PLS-SEM results for path coefficient estimates by adding a dimension to the analysis that considers the mean values of the latent variable scores (Ringle and Sarstedt, 2016). In this case, the IPMA for e-banking users (see **Figure 2**) shows that intention to use is observed to be the most critical factor in determining e-banking usage. An increase of one point in the performance of intention to use by a total effect of 0.786. Attitude toward using e-banking has higher importance on e-banking usage but lower than the intention to use. Similarly, the attitude has a lower performance than the intention to use. The perceived ease of use is the factor with the lowest performance. Finally, perceived usefulness has the lowest importance in determining e-banking usage (see **Figure 2**).

DISCUSSION

This study developed a research framework to understand the factors that contribute to e-banking usage and to benefit business strategies based on the co-creation of consumer value. The model provides a comprehensive view of the main factors influencing

e-banking intentions and the elements that should be considered to increase usage.

The results obtained concerning the application of TAM in the context of e-banking confirm the presence of significant relationships among perceived ease of use and perceived usefulness by the customer, being the most real relationship of the proposed model. Similarly, the relationships between perceived usefulness and attitude toward using e-banking, perceived ease of use and attitude toward using e-banking are also contrasted. However, the importance that perceived ease of use acquires in the attitude toward using e-banking is slightly higher than the influence that perceived usefulness has on this variable. Similarly, the relationships between perceived usefulness and intention to use, and attitude toward using e-banking and intention to use are also contrasted with previous studies, such as Salimon et al. (2017), Zhang et al. (2018), and Malaquias and Hwang (2019). Nevertheless, the results of the analysis of variance decomposition indicate that attitude toward using e-banking has relatively greater importance in intention to use compared to perceived usefulness. Therefore, an essential contribution of this research is the determination of attitude as a critical element in the determination of e-banking use intention. These results suggest that when e-banking users have a positive attitude toward using e-banking, it translates into a greater intention to use e-banking. Finally, the relationship between intention to use and e-banking usage is also verified, being the second strongest relationship of the model. In this sense, the results obtained by the IPMA analysis indicate that the intention to use is the variable



with the highest performance and the greatest importance in determining the adoption of e-banking. However, the perception of ease of use, despite the great importance in determining the use of e-banking, is the variable with the lowest performance in the proposed model.

These findings offer important implications for banks and financial institutions. The techniques and results of this study allow banks to identify possible deficiencies and apply improvements to establish greater interaction with their clients. Also, this study offers bank managers new tools that encourage co-creation through e-banking services, helping to achieve a competitive advantage.

Based on the results obtained, bank managers should pay special attention to the perceived ease of use and perceived usefulness of their e-services, since they contribute significantly to the adoption of e-banking by consumers. Perceived ease of use of e-banking services is one of the most relevant factors in the adoption of e-banking by consumers. However, the IPMA indicates that it is the factor with the lowest performance. As a consequence, banks can improve the usability and simplicity of their e-services and the performance of a banking transaction to facilitate and increase the e-banking usage. Likewise, customer service can be provided to guide and help the efficient use of these applications. Specifically, some authors such as Mostafa (2020) recommend the use of chatbot to facilitate the use of e-banking and co-create. Concurrently, the findings have shown the great importance of attitude in generating intention to use e-banking by consumers. Therefore, banks should encourage this attitude in consumers through the ease of use and usefulness provided by e-services.

By and large, as technology and smartphone advance, consumers will continue to seek out more personalized

and utilitarian services for their banking operations. Therefore, e-banking should be secure, and easy to learn and use. For this reason, providing reliable, user-friendly, and useful e-services are a crucial element in the interactions between consumer adoption of e-banking.

Limitations and Further Research

This study has some limitations that need to be addressed. The first limitation is the geographical location of the sample and the size of the sample. Future studies should incorporate a more significant number of online banking users covering a wider geographical area. Similarly, this study can increase the number of respondents between 34 and 53-year-old. Secondly, this study has not considered the moderating role of gender and age as socio-demographic variables. Previous authors, such as Natarajan et al. (2018), consider age as a great relevance in studies of acceptance of mobile applications. Further research may assess the moderating role of this variable in the proposed model. Thirdly, this model is based exclusively on functional characteristics of technology adoption, such as perceived ease of use and perceived usefulness. In the area of e-banking, authors such as Zhang et al. (2018) highlight other types of more emotional factors for the study of the adoption of e-banking services such as enjoyment or trust. Likewise, Singh and Srivastava (2020) highlight the perceived security in the factors of adoption of e-banking. Thus, a future proposal could include a combination of functional and emotional elements in e-banking environments. Finally, further research could incorporate external variables associated with value co-creation, such as the confidence in the bank. Some studies, such as

Mostafa (2020), suggest that consumer confidence in the bank can intensify the positive effect of the attitude toward e-banking. If customers believe that their bank is honest and professional, their positive attitude toward the use of e-banking will result in a disposition to co-create value with the bank by sharing information or providing feedback.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

REFERENCES

- Agarwal, R., and Karahanna, E. (2000). Time flies when you are having fun: cognitive absorption and beliefs about information technology usage. *MIS Q.* 24, 665–694. doi: 10.2307/3250951
- Ahmad, S., Bhatti, S. H., and Hwang, Y. (2019). E-service quality and actual use of e-banking: explanation through the technology acceptance model. *Inf. Dev.* 36, 503–519. doi: 10.1177/0266666919871611
- Ajzen, I. (1991). The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* 50, 179–211. doi: 10.1016/0749-5978(91)90020-T
- Akter, S., Motamarri, S., Hani, U., Shams, R., Fernando, M., Babu, M. M., et al. (2020). Building dynamic service analytics capabilities for the digital marketplace. *J. Bus. Res.* 118, 177–188. doi: 10.1016/j.jbusres.2020.06.016
- Andreu, L., Sainchez, I., and Mele, C. (2010). Value co-creation among retailers and consumers: new insights into the furniture market. *J. Retail. Consum. Serv.* 17, 241–250. doi: 10.1016/j.jretconser.2010.02.001
- Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Patil, P., and Dwivedi, Y. K. (2019). An integrated model for m-banking adoption in Saudi Arabia. *Int. J. Bank Mark.* 37, 452–478. doi: 10.1108/IJBM-07-2018-0183
- Bankia (2020). *Bankia Presenta el 'Humanismo Digital', Una Nueva Forma de Relacionarse Con Sus Clientes Basada en la Tecnología y las Personas*. Available online at: [11Thttps://www.bankia.com/es/comunicacion/noticias/bankia-humanismo-digital-clientes-tecnologia.html](https://www.bankia.com/es/comunicacion/noticias/bankia-humanismo-digital-clientes-tecnologia.html)11T (accessed October 7, 2020).
- Bigné, E., Ruiz, C., Aldás, J., and Sanz, S. (2008). Influence of online shopping information dependency and innovativeness on internet shopping adoption. *Online Inf. Rev.* 32, 648–667. doi: 10.1108/14684520810914025
- Carranza, R., Díaz, E., Martín-Consuegra, D., and Fernández-Ferrín, P. (2020). PLS-SEM in business promotion strategies. A multigroup analysis of mobile coupon users using MICOM. *Ind. Manag. Data Syst.* 120, 2349–2374. doi: 10.1108/IMDS-12-2019-0726
- Chepurna, M., and Criado, J. R. (2018). Identification of barriers to co-create online: the perspectives of customers and companies. *J. Res. Interact. Mark.* 12, 452–471. doi: 10.1108/JRIM-01-2018-0018
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2 Edn. Hillsdale, NJ: Erlbaum.
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manage. Sci.* 35, 982–1003. doi: 10.1287/mnsc.35.8.982
- Deb, M., and Lomo-David, E. (2014). An empirical examination of customers' adoption of m-banking in India. *Mark. Intell. Plan.* 32, 475–494. doi: 10.1108/MIP-07-2013-0119
- Dutot, V. (2015). Factors influencing near field communication (NFC) adoption: an extended TAM approach. *J. High Technol. Manag. Res.* 26, 45–57. doi: 10.1016/j.hitech.2015.04.005
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.1177/002224378101800104
- Glavee-Geo, R., Shaikh, A. A., and Karjaluoto, H. (2017). Mobile banking services adoption in Pakistan: are there gender differences? *Int. J. Bank Mark.* 35, 1090–1114. doi: 10.1108/IJBM-09-2015-0142
- Grönroos, C. (2011). Value co-creation in service logic: a critical analysis. *Mark. Theory* 11, 279–301. doi: 10.1177/1470593111408177
- Hair, J. F., Risher, J. J., Sarstedt, M., and Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *Eur. Bus. Rev.* 31, 2–24. doi: 10.1108/EBR-11-2018-0203
- Hair, J. F., Sarstedt, M., Ringle, C. M., and Gudergan, S. P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. Thousand Oaks, CA: SAGE Publications.
- Henseler, J., Hubona, G., and Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Ind. Manag. Data Syst.* 116, 2–20. doi: 10.1108/IMDS-09-2015-0382
- Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *J. Acad. Mark. Sci.* 43, 115–135. doi: 10.1007/s11747-014-0403-8
- Hosseini, M., Shajari, S., and Akbarabadi, M. (2020). Identifying multi-channel value co-creator groups in the banking industry. *J. Retail. Consum. Serv.* (in press). doi: 10.1016/j.jretconser.2020.102312
- Ind, N., and Coates, N. (2013). The meaning of co-creation. *Eur. Bus. Rev.* 25, 86–95. doi: 10.1108/09555341311287754
- Mainardes, E. W., Teixeira, A., and Romano, P. C. d. S. (2017). Determinants of co-creation in banking services. *Int. J. Bank Mark.* 35, 187–204. doi: 10.1108/IJBM-10-2015-0165
- Malaquias, R. F., and Hwang, Y. (2019). Mobile banking use: a comparative study with Brazilian and U.S. participants. *Int. J. Inf. Manag.* 44, 132–140. doi: 10.1016/j.jinfomgt.2018.10.004
- Malar, D. A., Arvidsson, V., and Holmstrom, J. (2019). Digital transformation in banking: exploring value co-creation in online banking services in India. *J. Glob. Inf. Technol. Manag.* 22, 7–24. doi: 10.1080/1097198X.2019.1567216
- Martovoy, A., and Santos, J. (2012). Co-creation and co-profiting in financial services. *Int. J. Entrep. Innov. Manag.* 16, 114–135. doi: 10.1504/IJEIM.2012.050446
- Medberg, G., and Heinonen, K. (2014). Invisible value formation: a netnography in retail banking. *Int. J. Bank Mark.* 32, 590–607. doi: 10.1108/IJBM-03-2014-0041
- Mostafa, R. B. (2020). Mobile banking service quality: a new avenue for customer value co-creation. *Int. J. Bank Mark.* 38, 1107–1132. doi: 10.1108/IJBM-11-2019-0421
- Natarajan, T., Balasubramanian, S. A., and Kasilingam, D. L. (2018). The moderating role of device type and age of users on the intention to use mobile shopping applications. *Technol. Soc.* 53, 79–90. doi: 10.1016/j.techsoc.2018.01.003
- O'Hern, M., and Rindfleisch, A. (2010). Customer co-creation: a typology and research agenda. *Rev. Mark. Res.* 6, 84–106. doi: 10.1108/S1548-643520090000006008
- Oliveira, P., and von Hippel, E. (2011). Users as service innovators: the case of banking services. *Res. Policy.* 40, 806–818. doi: 10.1016/j.respol.2011.03.009

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- Payne, A., Storkbacka, K., and Frow, P. (2008). Managing the co-creation of value. *J. Acad. Mark. Sci.* 36, 83–96. doi: 10.1007/s11747-007-0070-0
- Ringle, C. M., and Sarstedt, M. (2016). Gain more insight from your PLS-SEM results: the importance-performance map analysis. *Ind. Manage. Data Syst.* 116, 1865–1886. doi: 10.1108/IMDS-10-2015-0449
- Riquelme, H. E., and Rios, R. E. (2010). The moderating effect of gender in the adoption of mobile banking. *Int. J. Bank Mark.* 28, 328–341. doi: 10.1108/02652321011064872
- Salimon, M. G., Bin Yusoff, R. Z., Sanuri, S., and Mokhtar, M. (2017). The mediating role of hedonic motivation on the relationship between adoption of e-banking and its determinants. *Int. J. Bank Mark.* 35, 558–582. doi: 10.1108/IJBM-05-2016-0060
- Schierz, P., Schilke, O., and Wirtz, B. (2010). Understanding customer acceptance of mobile payment services: an empirical analysis. *J. Electron. Commer. Res. Appl.* 9, 209–216. doi: 10.1016/j.elerap.2009.07.005
- Schrieck, M., and Wiesche, M. (2017). “How established companies leverage it platforms for value co-creation – insights from banking,” in *Proceedings of the 25th European Conference on Information Systems*, Guimarães.
- Shaikh, A. A., and Karjaluoto, H. (2015). Mobile banking adoption: a literature review. *Telemat. Inform.* 32, 129–142. doi: 10.1016/j.tele.2014.05.003
- Shankar, A., and Jebarajakirthy, C. (2019). The influence of e-banking service quality on customer loyalty: a moderated mediation approach. *Int. J. Bank Mark.* 37, 1119–1142. doi: 10.1108/IJBM-03-2018-0063
- Shankar, A., Jebarajakirthy, C., and Ashaduzzaman, M. (2020). How do electronic word of mouth practices contribute to mobile banking adoption? *J. Retail. Consum. Serv.* 52:101920. doi: 10.1016/j.jretconser.2019.101920
- Sikdar, P., Kumar, A., and Makkad, M. (2015). Online banking adoption a factor validation and satisfaction causation study in the context of Indian banking customers. *Int. J. Bank Mark.* 33, 760–785. doi: 10.1108/ijbm-11-2014-0161
- Singh, S., and Srivastava, R. K. (2020). Understanding the intention to use mobile banking by existing online banking customers: an empirical study. *J. Financ. Serv. Mark.* 25, 86–96. doi: 10.1057/s41264-020-00074-w
- Statista (2020a). *Tasa de Penetración de los Servicios de Banca Online en España*. Available online at: <https://es.statista.com/estadisticas/501217/tasa-de-penetracion-de-los-servicios-de-banca-online-en-espana/> (accessed July 28, 2020).
- Statista (2020b). *Número de Clientes Digitales de los Principales Bancos con Presencia Digital en España*. Available online at: <https://es.statista.com/estadisticas/506244/numero-de-clientes-digitales-de-los-principales-bancos-con-presencia-digital-en-espana/> (accessed July 29, 2020).
- Stern, T., and Salb, D. (2015). Examining profile disclosure on online social networks: an affective, behavioural, and cognitive perspective. *Int. J. Electron. Bus.* 12, 162–184. doi: 10.1504/ijeb.2015.069106
- Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Q.* 27, 425–478. doi: 10.2307/30036540
- Wang, M., Cho, S., and Denton, T. (2017). The impact of personalisation and compatibility with past experience on e-banking usage. *Int. J. Bank Mark.* 35, 45–55. doi: 10.1108/IJBM-04-2015-0046
- Yaseen, S. G., and El Qireem, I. A. (2018). Intention to use e-banking services in the Jordanian commercial banks. *Int. J. Bank Mark.* 36, 557–571. doi: 10.1108/IJBM-05-2017-0082
- Yoon, H. S., and Steege, L. M. B. (2013). Development of a quantitative model of the impact of customers' personality and perceptions on internet banking use. *Comput. Hum. Behav.* 29, 1133–1141. doi: 10.1016/j.chb.2012.10.005
- Zhang, T., Lu, C., and Kizildag, M. (2018). Banking “on-the-go”: examining customers' adoption of mobile banking services. *Int. J. Qual. Serv. Sci.* 10, 279–295. doi: 10.1108/IJQSS-07-2017-0067
- Zollo, L., Carranza, R., Faraoni, M., Díaz, E., and Martín-Consuegra, D. (2020). What influences consumers' intention to purchase organic personal care products? The role of social reassurance. *J. Retail. Consum. Serv.* (in press). doi: 10.1016/j.jretconser.2020.102432

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Co-creation or Co-destruction: A Perspective of Online Customer Engagement Valence

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The increasing interest in online shopping in recent years has increased the importance of understanding customer engagement valence (CEV) in a virtual service network. There is yet a comprehensive explanation of the CEV concept, particularly its impact on multi-actor networks such as web stores. Therefore, this study aims to fill this research gap. In this study, past literature in the marketing and consumer psychology field was critically reviewed to understand the concept of CEV in online shopping, and the propositional-based style was employed to conceptualize the CEV within the online shopping (web stores) context. The outcomes demonstrate that the valence of customer engagement is dependent on the cognitive interpretation of signals that are prompted by multiple actors on a web store service network. If the signals are positively interpreted, positive outcomes such as service co-creation are expected, but if they are negatively interpreted, negative outcomes such as service co-destruction are predicted. These notions create avenues for future empirical research and practical implications.

Keywords: service co-destruction, service co-creation, online shopping, valence, engagement (involvement)

INTRODUCTION

The advancement in technology and the rise of industrial revolution 4.0 have increased the appeal of online shopping, and it can be observed through the dramatic increase of worldwide volume of online sales—USD 1,336 billion in 2014 to USD 2,382 billion in 2017, grows to USD 2,982 billion in 2018, and is expected to reach USD 5,695 billion by 2022 (Statista, 2019). The pattern demonstrates the promising prospects that online businesses have in the upcoming years. Furthermore, renowned web stores such as Tencent, Aliba, and eBay are examples of conventional business engagement with online business models, consequently providing significant benefits for firms, and customers.

Online shopping provides customers with the option to evaluate brands based on comments and ratings (Ozen and Engizek, 2014) and enable them to save time, cost, and energy. Through online shopping, businesses can reduce operational costs and resource expenditure, allowing a bigger customer database to be generated. In addition, businesses can communicate with the customers

virtually, ensuring positively engaged customers for a competitive edge (Kumar and Pansari, 2016). Engagement is the customers' psychological state of mind resulting from the interaction with the web stores and its associated services during the process of purchase (Van Doorn et al., 2010), and understanding its impact is crucial in building a customer-centric business model.

Customers' engagement with a web store can be advantageous for businesses (Thakur, 2018) as it can lead to actual purchases (Brien and Toms, 2010). Following this, web stores tend to provide esthetically pleasant, user-friendly, and secure web store platforms to provide customers with a unique shopping experience that may lead to actual purchases (Lăzăroiu et al., 2020). According to the signaling theory, the situation is symmetric information exchange between the online service provider and the customer, which generates positive outcomes (Connelly et al., 2011) as well as a negative outcome, especially if the customers experienced or witnessed a bad shopping experience. The customers' engagement with a brand, product, service, and web store that is based on their experience, be it negative or positive, is referred to as customer engagement valence (CEV; Van Doorn et al., 2010).

There have been several debates on the development of CEV and its possible outcomes (Storbacka et al., 2016; Li et al., 2017, 2018). Some argued that engagement is context-specific (Brodie et al., 2011) where customers either positively or negatively engaged depending on the context (Hollebeek and Chen, 2014; Juric et al., 2015). Positive engagement will yield positive outcomes such as purchase behavior, satisfaction, and loyalty (Hollebeek and Chen, 2014), but negative engagement may spread negative reviews (Loureiro and Kaufmann, 2018) that ward off customers (Weisstein et al., 2017). Nonetheless, some prove that negative engagement may cause positive outcomes (Juric et al., 2015), repeat purchase intention, and loyalty (Bruneau et al., 2018). These contradictions demonstrate that a clear line of inquiry between antecedents and CEV outcomes is missing.

In this study, the service-dominant logic (SDL) lens was used to assess the nature of CEV in the online shopping context. In online shopping, various actors trade ideas and experiences to co-create service (Vargo and Lusch, 2016; González-Torres et al., 2020). In the signaling theory perspective, the information shared for co-creation of service act as nodes in the service eco-system (Pee et al., 2018). The information nodes prompt customers to engage with various actors on the platform. This study intends to identify the possible outcomes on the customers' engagement in which the web store utilizes information nodes as a medium of information.

Moreover, based on the integration of thoughts and SDL perspective, this study proposes that CEV in a web store can cause service co-creation or service co-destruction. The CEV is taken as a psychological, cognitive, and interactive component, in which the direction of customers' engagement depends on their cognitive interpretation of the signals transmitted by other actors in a virtual network. Customers tend to engage positively with a web store if they have a positive and pleasant view of the web store (Vivek et al., 2012), especially if they have the opportunity to collaborate with other customers (Grönroos and Voima, 2013). The collaboration

is called collaborative service co-creation (Bhalla, 2010). In contrast, unpleasant and negative perceptions for the web store will result in negative engagement (Juric et al., 2015; Naumann et al., 2017), causing service co-destruction through negative comments and low ratings. This study proposed that CEV is context-specific; it can generate service co-creation or service co-destruction based on information available on the web store and customers' experience.

LITERATURE REVIEW

Customer Engagement in Online Shopping

Customer engagement (CE) is a wide niche in marketing research (Kumar et al., 2010; Brodie et al., 2011; Vivek et al., 2012; Moliner et al., 2018), and it pertains to the customers' psychological state of mind that is induced by their experience in the engagement with the objects (such as web stores or actors). Engagement is a multidimensional construct composed of the cognitive, emotional, and behavioral states (Brodie et al., 2011) that can be observed through participation and involvement (Gebauer et al., 2013), which includes behavioral indications such as word of mouth (Gebauer et al., 2013), and altruistic behaviors (Hsieh and Chang, 2016). Past studies have investigated engagement through multiple perspectives—CE behaviors (Van Doorn et al., 2010; Jaakkola and Alexander, 2014; Verleye et al., 2014), consumer engagement (Brodie et al., 2013), consumer brand engagement (Rana and Dwivedi, 2016; Solem and Pedersen, 2016), customer-brand community engagement (Gummerus et al., 2012), service technology engagement (Bolton and Saxena-Iyer, 2009), advertising engagement (Phillips and Mcquarrie, 2010), and brand engagement in self-concept (Sprott et al., 2009). Most of these studies are within the context of physical customers' interaction, which is different from virtual CE; the latter involves multiple actors simultaneously (customer-to-web store engagement, customer-to-e-retailer engagement, and customer-to-CE). The multiplicity causes inconsistent outcomes of CE as each engagement provides an individual interaction experience, hence, assessing CEV is of higher importance compared to considering CE only.

Customer Engagement Valence

Valence refers to the positive association with an individual's behavior, emotions, evaluation, and cognition (Colombetti, 2005), and it was initially perceived to be formed from an object (Li et al., 2018). It is claimed that an object influences attraction (positive force) or repulsion (negative force); it influences the direction of behavior (Tolman, 1932). Apart from that, an individual's evaluation, cognition, and emotions also influence valence (Dulabh et al., 2018) as positivity and negativity are related to the emotions of a person (Brodie et al., 2011; Li et al., 2018) and valence is the consequence of an individual's evaluation of the object (Hollebeek et al., 2014). In marketing research, valence is explored as CEV—a behavioral outcome of CE with an object, brand, or company's resources. Hollebeek and Chen (2014) define CEV as the positive and negative engagement of customers associated with the

brand's favorable (positive) and unfavorable (negative) emotions, behavior, and thoughts. Bowden et al. (2015, 2017), and Naumann et al. (2017) echo this notion, claiming that the valence of customers' engagement can be influenced by different attributes such as a behavioral outcome and the brand's key attributes. Nonetheless, these studies focus only on the physical interaction settings. A brief on past studies on engagement valence is provided in **Table 1**.

There is limited research on CEV within virtual environments such as a web store, an interactive platform that provides various cues (signals) to the customers (Wells et al., 2011). Ease of use, brand and warranty information, product features, retailer ratings, delivering options, and price comparisons are some of the signals often used by the customers in their decision-making process while shopping online (Wells et al., 2011); hence, they are important in assessing customer's level of engagement (Connelly et al., 2011). In the process of online shopping, an actor (web store management) communicates information (signals) that is interpreted and engaged by another actor (customer), who then provides feedback (comments or purchase) to the initial actor. The engagement takes place virtually, and web store management does not have control over the engagement valence on the receiving end as it relies entirely on the customer's

understanding and interpretation of the information. The valence is also influenced by information shared by other actors, such as comments and ratings.

The customers are considered to be positively engaged if the information received by all nodes and actors is symmetric (Wells et al., 2011), and they are more likely to start co-creating the service with the web store and other actors. If the information is asymmetric, customers might engage negatively with a web store, resulting in service co-destruction.

Service Co-creation and Co-destruction

Service is the use of knowledge and skills to produce real value (value-in-use) from the potential values of products (Grönroos, 2011) and is co-created through the collaboration of multiple actors and resources integration with the aim to create value for the benefit of all (Vargo and Lusch, 2016; Shamim et al., 2017). Co-creation cannot occur without the engagement of multiple actors (Shamim et al., 2016). Resource integration is the exchange of service among the actors (Li et al., 2018). The co-creative service produces value for all parties—customers gain utilities from the products and services, and companies gain financial value, customer equity, customer trust, and customer satisfaction (Chandler and Lusch, 2015). Nevertheless, such

TABLE 1 | Past literature on engagement valence.

S/No	Methodology	Source	Engagement valence	Research context
1.	Conceptual	Van Doorn et al., 2010 Journal of service research	The valence of engagement perceived based on the positive and negative outcomes.	Theoretical foundations of customer engagement
2.	Exploratory	Hollebeek and Chen, 2014 Journal of product and brand management	Positive and negative outcomes of customer engagement refer to positive and negative outcomes.	The conceptual model for positive and negative customer engagement
3.	Exploratory	Bowden et al., 2015 Journal of marketing management	If the outcome of engagement is withdrawal, customer engagement is considered as positive and vice versa.	Engagement and disengagement of customers
4.	Conceptual	De Villiers, 2015 Journal of business research	The valence of engagement is perceived based on the behavioral outcome of the engagement.	New perspective in consumer brand engagement literature
5.	Exploratory	Bowden et al., 2017 Book chapter from customer engagement: Contemporary issues and challenges	The valence of engagement is perceived based on the behavioral outcome of the engagement.	Positive and negative engagement in online brand communities
6.	Exploratory	Juric et al., 2015 Book chapter from customer engagement: Contemporary issues and challenges	If a customer is positively engaged, then the behavioral outcomes are beneficial for others, and if the customer is negatively engaged, then the outcomes are harmful to others in a network	Negative engagement of customers in blogs.
7.	Exploratory	Dolan et al., 2017 Book chapter from customer engagement: Contemporary issues and challenges	Positive engagement in social media leads the participant to consume or contribute to user-created content. Negative engagement leads the participant to withdraw or to contribute negatively to user-created contents.	Social media engagement
11.	Exploratory	Li et al., 2018 Journal of service theory and practice	The outcome of engagement can be positive or negative, which is perceived differently by different actors in a network.	Engagement valence of actors in a network
12.	Conceptual	Li et al., 2017 Journal of service management	The valence of engagement resides in the past, present, and future psychological disposition that shifts between positive, negative, and ambivalent engagement	Multi-actor engagement in a network

dyadic interaction may cause negative engagement such as service failure, bad review comments, late delivery, or any other arising factors that negatively influence the customer's behavior (Čaić et al., 2018).

Web stores provide a platform in which service providers are available to facilitate customers in experiencing unique value creation as the service providers are eager to provide services that can produce service co-creation instead of service co-destruction. Service platforms (web stores) mediate this process by facilitating the interaction between different actors, a crucial part of the service eco-system (Lusch and Nambisan, 2015). Web stores facilitate the interaction between actors such as web store personnel, suppliers, retailers, distributors, and customers for co-creating service, and are developed with different features and structures based on their product variety and design hierarchy (Kane and Bigham, 2014). For example, relationships on Facebook are initiated by a one-sided request and are based on friend requests, while Twitter operates based on followings (Kane and Bigham, 2014). In the same vein, web stores enable a business relationship between different actors to trade information, knowledge, and experience that are deemed beneficial for all actors (Vargo and Lusch, 2016). Positive interaction leads to co-creative service, while negative interaction will co-destruct the service.

CONCEPTUALIZATION OF CEV

In this study, the signaling theory is used to conceptualize CEV and establish its relationship with service co-creation and service co-destruction pertaining to web store online shopping (Figure 1). Online business is a wide actor-to-actor service network composed of multiple actors and institutions that interact with each other and share institutions to co-create value. Signals (cues) such as information, web store esthetics, comments, and ratings are used to interact with each other and to engage with the customers who will later interpret the signals and behave accordingly (Kirmani and Rao, 2000). As mentioned before, engagement is dependent on the cognitive interpretation

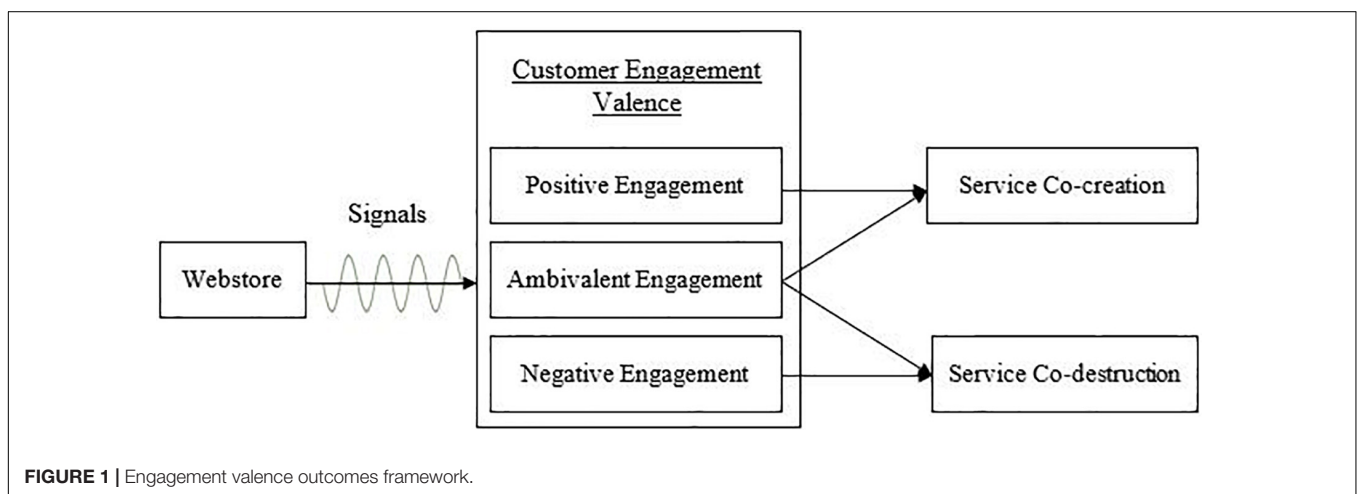
of signals generated by web stores. Based on SDL, different actors integrate their knowledge (comments and rating) in their own experience, and one customer's knowledge may affect the purchase decision of other customers in a positive (service co-creation) or negative (service co-destruction) way (Floh et al., 2013). This study proposes that customers who interpret the signals positively will develop service co-creation, while those who interpret the signals negatively will develop service co-destruction.

PROPOSITIONS FOR CEV IN SERVICE CO-CREATION NETWORK

There are different conceptualizations of CE. A stream believes that valence is closely related to the behavior of customers during interaction with a brand or human—positive or negative behavior is caused by positive or negative engagement (Hollebeek and Chen, 2014; Bowden et al., 2015; Triantafyllidou and Siomkos, 2018). Meanwhile, another stream believes that behavioral engagement and its outcome are independent of each other (Li et al., 2017) and that the valence is within the behavioral engagement, not its outcomes. As stated by Li et al. (2018), “the valence of actor engagement resides in the focal actor's past, current and future psychological disposition.”

In online shopping, customers' engagement is human-computer interaction. Past researches mainly focus on engagement in customer-brand or customer-customer interactions, which have different attraction or repulsion aspects. Different aspects pertain to human-computer interaction (Li et al., 2015), such as esthetics, ease of use, comments, and rating, which act as signals in prompting customers' engagement and behavior (Wells et al., 2011; Zhang et al., 2017). A positive signal may be negative to another customer—for example, delivery time may not be of the same importance between different customers. Based on the signaling theory, this study proposes that:

Proposition 1: *Valence of CE exists in the cognitive interpretation of signals sent by other customers and service providers in a web store.*



Moreover, a customer can engage positively or negatively (Hollebeek and Chen, 2014), or they may have ambivalent emotions toward a web store (Li et al., 2018) as it can be both trusted and distrusted at the same time (Moody et al., 2014). Since the valence of engagement is associated with the cognitive interpretation of signals, the engagement may be ambivalent, and the valence can be positive, negative, or ambivalent (Li et al., 2018). The shift between the valences is worthy of being studied.

Actors in web stores utilize signals (information and knowledge sharing; Moody et al., 2014); positive engagement is caused by positive interpretation of the signals (Kirmani and Rao, 2000; Ullah et al., 2016). Furthermore, symmetric knowledge sharing and service exchange between different actors can produce positive engagement, asymmetric information may produce negative engagement, and simultaneous symmetric and asymmetric information exchange may lead to ambivalent engagement. Therefore, this study proposes that:

Proposition 2: *Valence of CE shifts between positive, negative, and ambivalent based on the symmetric or asymmetric knowledge sharing or service exchange.*

There is a lack of depth in the understanding of the conditions that affect the outcome of CEV. Hollebeek and Chen (2014) argues that the outcomes are not based on the direction of engagement; it is the opposite as some negatively engaged customers may still exhibit positive outcomes, such as the members of “I hate Facebook” Facebook pages who, ironically, still use the platform (Juric et al., 2015). Meanwhile, a harmful behavioral outcome for other actors is considered as a negative outcome (Juric et al., 2015). These researches believe that CEV can be positive or negative, and it is affected by the direction of engagement (Zhang et al., 2018). There are three main levels of CE—high, medium, and low—in both positive and negative directions (Smith, 2013), and a low negative engagement may yield positive outcomes and vice versa. Signaling theory postulates that the behavior of a customer is based on their interpretation of signals received from the web store. Therefore, this study proposes that:

Proposition 3(a): *If the signals provided by the actors are positively interpreted, they are expected to generate positive outcomes such as service co-creation.*

Proposition 3(b): *If the signals provided by the actors are negatively interpreted, they are expected to generate negative outcomes such as service co-destruction.*

DISCUSSION ON FINDINGS

This study responds to the call of recent studies such as Storbacka et al. (2016), Li et al. (2017, 2018) by conceptualizing CEV and identifying the outcomes generated by CEV from the perspective of signaling theory. In this study, CEV is defined as a psychological construct in which web stores generate

TABLE 2 | Propositions for research implications.

Propositions	Research question
P1: Valence of customer engagement lies in the cognitive interpretation of signals sent by other customers and service providers on a web store.	What is the role of service providers in generating positive or negative signals?
P2: Valence of customer engagement shifts between positive, negative, and ambivalent based on the symmetric or asymmetric knowledge sharing or service exchange.	How can information be exchanged symmetrically between different customers in a web store? When is a customer in the state of ambivalent engagement? What are the possible outcomes of ambivalent engagement?
P3a: If the signals provided by the actors are positively interpreted, it is expected to generate positive outcomes such as service co-creation.	What are other possible outcomes of customer engagement valence? In which conditions does customer engagement valence lead to service co-creation and service co-destruction?
P3b: If the signals provided by the actors is negatively interpreted, it is expected to generate negative outcomes such as service co-destruction.	

signals during customer–web store interactions in the form of comments, reviews, star rating, price, information of product, and the esthetic of the website, which are interpreted and acted upon by the customers. Signaling theory explains that the exchange of symmetric knowledge between different actors generates positive outcomes and vice versa (Kirmani and Rao, 2000). Li et al. (2018) aptly define customers’ engagement valence as either positive or negative engagement, but this study proposes that the valence resides in the cognitive interpretation of signals based on signaling theory rather than the outcomes or the brand itself, which is echoed by Hollebeek and Chen (2014), Bowden et al. (2017), and Naumann et al. (2017) and in contrast with Dolan et al. (2017) who claim that valence resides in the outcomes of engagement. This research bases its idea on SDL (Vargo and Lusch, 2008, 2016) and proposes service co-creation and service co-destruction as behavioral outcomes of CEV.

Furthermore, the behavioral outcomes of engagement vary according to the structure of each network. There are two main behavioral outcomes of CEV—positive and negative (Hollebeek and Chen, 2014; Juric et al., 2015)—and customers may share positive (service co-creation) or negative (service co-destruction) experience after engaging with the web store through comments and ratings, which can affect other actors’ decision-making positively (service co-creation) or negatively (service co-destruction; Vargo and Lusch, 2008, 2016).

IMPLICATIONS, LIMITATIONS, AND FUTURE RECOMMENDATIONS

Theoretically, this study proposes the outcomes of CEV in an online business context. It is observed that CEV is difficult to operationalize, and observing the direction of customers’

engagement can be tricky. Engagement produces outcomes, and this has yet to be adequately discussed in previous researches, particularly in the context of online service networks such as web stores. Two outcomes are proposed in this study. Positively engaged customers are likely to provide positive comments, supports, and recommendations that are in favor of the brand and participate in service co-creation. Meanwhile, negatively engaged customers are more likely to provide low ratings and negative comments; they engage in service co-destruction. In addition, engagement can be positive, negative, and ambivalent based on symmetric or asymmetric knowledge sharing. Positively interpreted signals may produce positive outcomes (service co-creation), while negatively interpreted signals may produce negative outcomes (service co-destruction).

This framework requires empirical validation to prove the propositions as it is useful for web stores, e-retailers, and customers—web stores can predict the outcomes of the CEV and propose intervention strategies to reduce negative engagement. It should be noted that co-destruction can create a ripple effect affecting many other actors involved in the service network; hence web stores need to minimize the co-destruction probability. In addition, this study raises intriguing questions regarding the nature and extent of the CEV and the measurement of this concept. Since capturing the CEV using subjective measures is not easy due to its psychological state of mind, this study proposes that the CEV should be measured

using neuromarketing approaches such as electroencephalogram (EEG) and human-eye tracking (HET). These approaches may generate real-time data that can be useful to predict the outcomes and devise strategies. Also, further research is needed to establish the measurement scales for service co-creation and service co-destruction—Table 2 presents possible propositions and research questions in need of empirical validation. This study is limited as it is conceptual; therefore, empirical validation is needed for more practical implications.

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REFERENCES

- Bhalla, G. (2010). *Collaboration and Co-Creation*. Berlin: Springer, 1–16.
- Bolton, R., and Saxena-Iyer, S. (2009). Interactive services: a framework, synthesis and research directions. *J. Interactive Mark.* 23, 91–104. doi: 10.1016/j.intmar.2008.11.002
- Bowden, J. L. H., Conduit, J., Hollebeek, L. D., Luoma-Aho, V., and Solem, B. A. (2017). Engagement valence duality and spillover effects in online brand communities. *J. Serv. Theory Pract.* 27, 877–897. doi: 10.1108/jstp-04-2016-0072
- Bowden, J. L. H., Gabbott, M., and Naumann, K. (2015). Service relationships and the customer disengagement - engagement conundrum. *J. Mark. Manag.* 31, 774–806. doi: 10.1080/0267257x.2014.983143
- Brien, H. L., and Toms, E. G. (2010). The development and evaluation of a survey to measure user engagement. *J. Am. Soc. Inform. Sci. Technol.* 61, 50–69. doi: 10.1002/asi.21229
- Brodie, R. J., Hollebeek, L. D., Juric, B., and Ilic, A. (2011). Customer engagement: conceptual domain, fundamental propositions, and implications for research. *J. Serv. Res.* 14, 252–271. doi: 10.1177/1094670511411703
- Brodie, R. J., Ilic, A., Juric, B., and Hollebeek, L. (2013). Consumer engagement in a virtual brand community: an exploratory analysis. *J. Bus. Res.* 66, 105–114. doi: 10.1016/j.jbusres.2011.07.029
- Bruneau, V., Swaen, V., and Zidda, P. (2018). Are loyalty program members really engaged? measuring customer engagement with loyalty programs. *J. Bus. Res.* 91, 144–158. doi: 10.1016/j.jbusres.2018.06.002
- Čaić, M., Odekerken-Schröder, G., and Mahr, D. (2018). Service robots: value co-creation and co-destruction in elderly care networks. *J. Serv. Manag.* 29, 178–205. doi: 10.1108/josm-07-2017-0179
- Chandler, J. D., and Lusch, R. F. (2015). Service systems: a broadened framework and research agenda on value propositions, engagement, and service experience. *J. Serv. Res.* 18, 6–22. doi: 10.1177/1094670514537709
- Colombetti, G. (2005). Appraising valence. *J. Conscious. Stud.* 12, 103–126.
- Connelly, B. L., Certo, S. T., Ireland, R. D., and Reutzel, C. R. (2011). Signaling theory: a review and assessment. *J. Manag.* 37, 39–67. doi: 10.1177/0149206310388419
- De Villiers, R. (2015). Consumer brand enmeshment: typography and complexity modeling of consumer brand engagement and brand loyalty enactments. *J. Bus. Res.* 68, 1953–1963. doi: 10.1016/j.jbusres.2015.01.005
- Dolan, R., Conduit, J., Fahy, J., and Goodman, S. (2017). Social media: communication strategies, engagement and future research directions. *Int. J. Wine Bus. Res.* 29, 2–19. doi: 10.1108/ijwbr-04-2016-0013
- Dulabh, M., Vazquez, D., Ryding, D., and Casson, A. (2018). “Measuring consumer engagement in the brain to online interactive shopping environments,” in *Augmented Reality and Virtual Reality- Empowering Human, Place and Business* 1 edn. eds M. Claudia tom Dieck and T. H. Jung. (Berlin: Springer), 145–165. doi: 10.1007/978-3-319-64027-3_11
- Floh, A., Koller, M., and Zauner, A. (2013). Taking a deeper look at online reviews: the asymmetric effect of valence intensity on shopping behaviour. *J. Mark. Manag.* 29, 646–670. doi: 10.1080/0267257x.2013.776620
- Gebauer, J., Fuller, J., and Pezzer, R. (2013). The dark and the bright side of co-creation: triggers of member behavior in online innovation communities. *J. Bus. Res.* 66, 1516–1527. doi: 10.1016/j.jbusres.2012.09.013
- González-Torres, T., Rodríguez-Sánchez, J.-L., Montero-Navarro, A., and Gallego-Losada, R. (2020). Visualizing research on industrial clusters and global value chains: a bibliometric analysis. *Front. Psychol.* 11:1754.
- Grönroos, C. (2011). Value co-creation in service logic: a critical analysis. *Mark. Theory* 11, 279–301. doi: 10.1177/1470593111408177
- Grönroos, C., and Voima, P. (2013). Critical service logic: making sense of value creation and co-creation. *J. Acad. Mark. Sci.* 41, 133–150. doi: 10.1007/s11747-012-0308-3
- Gummerus, J., Liljander, V., Weman, E., and Pihlström, M. (2012). Customer engagement in a facebook brand community. *Manag. Res. Rev.* 35, 857–877. doi: 10.1108/01409171211256578
- Hollebeek, L. D., and Chen, T. (2014). Exploring positively-versus negatively-valenced brand engagement: a conceptual model. *J. Product Brand Manag.* 23, 62–74. doi: 10.1108/jpbm-06-2013-0332
- Hollebeek, L. D., Glynn, M. S., and Brodie, R. J. (2014). Consumer brand engagement in social media: conceptualization, scale development and validation. *J. Interactive Mark.* 28, 149–165. doi: 10.1016/j.intmar.2013.12.002

- Hsieh, S. H., and Chang, A. (2016). The psychological mechanism of brand co-creation engagement. *J. Interactive Mark.* 33, 13–26. doi: 10.1016/j.intmar.2015.10.001
- Jaakkola, E., and Alexander, M. (2014). The role of customer engagement behavior in value co-creation: a service system perspective. *J. Serv. Res.* 17, 247–261. doi: 10.1177/1094670514529187
- Juric, B., Smith, S., and Wilks, G. (2015). *Negative Customer Brand Engagement*. New York, NY: Routledge.
- Kane, S. K., and Bigham, J. P. (2014). “Tracking@ stemxcomet: teaching programming to blind students via 3D printing, crisis management, and twitter,” in *Proceedings of the 45th ACM Technical Symposium on Computer Science Education*, (New York, NY: ACM), 247–252.
- Kirmani, A., and Rao, A. R. (2000). No pain, no gain: a critical review of the literature on signaling unobservable product quality. *J. Mark.* 64, 66–79. doi: 10.1509/jmkg.64.2.66.18000
- Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., and Tillmanns, S. (2010). Undervalued or overvalued customers: capturing total customer engagement value. *J. Serv. Res.* 13, 297–310. doi: 10.1177/1094670510375602
- Kumar, V., and Pansari, A. (2016). Competitive advantage through engagement. *J. Mark. Res.* 53, 497–514. doi: 10.1509/jmr.15.0044
- Lăzăroiu, G., Neguriță, O., Grecu, I., Grecu, G., and Mitran, P. C. (2020). Consumers’ decision-making process on social commerce platforms: online trust, perceived risk, and purchase intentions. *Front. Psychol.* 11:890.
- Li, L. P., Juric, B., and Brodie, R. J. (2018). Actor engagement valence: conceptual foundations, propositions and research directions. *J. Serv. Manag.* 29, 491–516. doi: 10.1108/josm-08-2016-0235
- Li, H., Fang, Y., Wang, Y., Lim, K. H., and Liang, L. (2015). Are all signals equal? Investigating the differential effects of online signals on the sales performance of e-marketplace sellers. *Inform. Technol. People* 28, 699–723. doi: 10.1108/itp-11-2014-0265
- Li, L. P., Juric, B., and Brodie, R. J. (2017). Dynamic multi-actor engagement in networks: the case of United Breaks guitars. *J. Serv. Theory Pract.* 27, 738–760. doi: 10.1108/jstp-04-2016-0066
- Loureiro, S. M. C., and Kaufmann, H. R. (2018). The role of online brand community engagement on positive or negative self-expression word-of-mouth. *Cogent Bus. Manag.* 5:1508543. doi: 10.1080/23311975.2018.1508543
- Lusch, R. F., and Nambisan, S. (2015). Service innovation: a service-dominant logic perspective. *MIS Q.* 39, 155–175.
- Moliner, M. Á., Monferrer-Tirado, D., and Estrada-Guillén, M. (2018). Consequences of customer engagement and customer self-brand connection. *J. Serv. Mark.* 32, 387–399. doi: 10.1108/jsm-08-2016-0320
- Moody, G. D., Galletta, D. F., and Lowry, P. B. (2014). When trust and distrust collide online: the engenderment and role of consumer ambivalence in online consumer behavior. *Electron. Commer. Res. Appl.* 13, 266–282. doi: 10.1016/j.elerap.2014.05.001
- Naumann, K., Bowden, J., and Gabbott, M. (2017). A multi-valenced perspective on consumer engagement within a social service. *J. Mark. Theory Pract.* 25, 171–188. doi: 10.1080/10696679.2016.1270772
- Ozen, H., and Engizek, N. (2014). Shopping online without thinking: being emotional or rational? *Asia Pac. J. Mark. Logistics* 26, 78–93. doi: 10.1108/apjml-06-2013-0066
- Pee, L. G., Jiang, J., and Klein, G. (2018). Signaling effect of website usability on repurchase intention. *Int. J. Inform. Manag.* 39, 228–241. doi: 10.1016/j.ijinfomgt.2017.12.010
- Phillips, B. J., and Mcquarrie, E. F. (2010). Narrative and persuasion in fashion advertising. *J. Consum. Res.* 37, 368–392. doi: 10.1086/653087
- Rana, N. P., and Dwivedi, Y. K. (2016). Using clickers in a large business class: examining use behavior and satisfaction. *J. Mark. Educ.* 38, 47–64. doi: 10.1177/0273475315590660
- Shamim, A., Ghazali, Z., and Albinsson, P. A. (2016). An integrated model of corporate brand experience and customer value co-creation behaviour. *Int. J. Retail Distribution Manag.* 44, 139–158. doi: 10.1108/ijrdm-06-2015-0079
- Shamim, A., Ghazali, Z., and Albinsson, P. A. (2017). Construction and validation of customer value co-creation attitude scale. *J. Consum. Mark.* 34, 591–602. doi: 10.1108/jcm-01-2016-1664
- Smith, A. M. (2013). The value co-destruction process: a customer resource perspective. *Eur. J. Mark.* 47, 1889–1909. doi: 10.1108/ejm-08-2011-0420
- Solem, B. A. A., and Pedersen, P. E. (2016). The effects of regulatory fit on customer brand engagement: an experimental study of service brand activities in social media. *J. Mark. Manag.* 32, 445–468. doi: 10.1080/0267257x.2016.1145723
- Sprott, D., Czellar, S., and Spangenberg, E. (2009). The importance of a general measure of brand engagement on market behavior: development and validation of a scale. *J. Mark. Res.* 46, 92–104. doi: 10.1509/jmkr.46.1.92
- Statista (2019). *E-commerce Worldwide - Statistics & Facts [Online]*. Available <https://www.statista.com/topics/871/online-shopping/> (accessed August 22, 2020).
- Storbacka, K., Brodie, R. J., Bohmann, T., Maglio, P. P., and Nenonen, S. (2016). Actor engagement as a microfoundation for value co-creation. *J. Bus. Res.* 69, 3008–3017. doi: 10.1016/j.jbusres.2016.02.034
- Thakur, R. (2018). Customer engagement and online reviews. *J. Retailing Consum. Serv.* 41, 48–59. doi: 10.1016/j.jretconser.2017.11.002
- Tolman, E. C. (1932). *Purposive Behavior in Animals and Men*. New York, NY: Century.
- Triantafyllidou, A., and Siomkos, G. (2018). The impact of facebook experience on consumers’ behavioral brand engagement. *J. Res. Interactive Mark.* 12, 164–192. doi: 10.1108/jrim-03-2017-0016
- Ullah, R., Amblee, N., Kim, W., and Lee, H. (2016). From valence to emotions: exploring the distribution of emotions in online product reviews. *Decis. Support Syst.* 81, 41–53. doi: 10.1016/j.dss.2015.10.007
- Van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., et al. (2010). Customer engagement behavior: theoretical foundations and research directions. *J. Serv. Res.* 13, 253–266. doi: 10.1177/1094670510375599
- Vargo, S. L., and Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *J. Acad. Mark. Sci.* 36, 1–10. doi: 10.1007/s11747-007-0069-6
- Vargo, S. L., and Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *J. Acad. Mark. Sci.* 44, 5–23. doi: 10.1007/s11747-015-0456-3
- Verleye, K., Gemmel, P., and Rangarajan, D. (2014). Managing engagement behaviors in a network of customers and stakeholders: evidence from the nursing home sector. *J. Serv. Res.* 17, 68–84. doi: 10.1177/1094670513494015
- Vivek, S. D., Beatty, S. E., and Morgan, R. M. (2012). Customer engagement: exploring customer relationships beyond purchase. *J. Market. Theory Pract.* 20, 122–146. doi: 10.2753/mtp1069-6679200201
- Weinstein, F. L., Song, L., Andersen, P., and Zhu, Y. (2017). Examining impacts of negative reviews and purchase goals on consumer purchase decision. *J. Retailing Consum. Serv.* 39, 201–207. doi: 10.1016/j.jretconser.2017.08.015
- Wells, J. D., Valacich, J. S., and Hess, T. J. (2011). What signal are you sending? how website quality influences perceptions of product quality and purchase intentions. *MIS Q.* 35, 373–396. doi: 10.2307/23044048
- Zhang, J., Li, H., Yan, R. L., and Johnston, C. (2017). Examining the signaling effect of E-tailers’ return policies. *J. Comput. Inform. Syst.* 57, 191–200. doi: 10.1080/08874417.2016.1183989
- Zhang, T., Lu, C., Torres, E., and Chen, P.-J. (2018). Engaging customers in value co-creation or co-destruction online. *J. f Serv. Mark.* 32, 57–69. doi: 10.1108/jsm-01-2017-0027

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Exploring the Relationship Between Users' Psychological Contracts and Their Knowledge Contribution in Online Health Communities

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The knowledge contribution of members is essential and beneficial to both the business and users of online health communities (OHCs). This study explores and tests the effects of OHC users' psychological contracts on their community identification and knowledge-sharing behavior. A total of 362 valid responses from several well-known OHCs in China are used in the data analysis. The results of the path analysis with structural equation modeling show that users' transactional psychological contracts have a negative effect on their knowledge contribution both directly and indirectly by weakening their community identification. In contrast, users' relational psychological contracts can lead to increased active knowledge contributions both directly and indirectly by enhancing their community identification. Knowledge sharing self-efficacy can strengthen the relationship between relational psychological contracts and knowledge contributions, and the relationship between community identification and knowledge contributions. However, it has no significant impact on the path from transactional psychological contracts to knowledge contribution. The implications and direction of future works are presented on the basis of the results of the empirical analysis.

Keywords: online health community, transactional psychological contracts, relational psychological contracts, community identification, knowledge sharing self-efficacy, knowledge contribution

INTRODUCTION

Knowledge has been recognized as an important strategic resource and a sustainable competitive advantage for individuals and organizations, especially for those in environments with uncertain factors (Wasko and Faraj, 2005; Yu et al., 2010). Knowledge sharing is an activity through which knowledge is exchanged among individuals in an organization to allow recipients to improve their performance (Yu et al., 2010). Today, the rise of the Internet has enabled knowledge sharing and contribution in various ways, such as through online group meetings, which were not possible before, and it also stimulates the development of professional virtual communities that enable participants to share knowledge with one another without ever having to meet in person (Hsu et al., 2007). People are familiar with many of these virtual communities, such as WeChat, weblogs, and specialized virtual communities, including online health communities (OHCs). OHCs are places where people with health problems can obtain a major source of support. These communities allow members not only to retrieve information but also to share their own experiences and communicate with peers that experience the same health problems (Zhao et al., 2014).

Knowledge sharing in OHCs is common today. Over 80% of adult netizens in America use the Internet for health-related purposes. Among them, 34% read the health-related information or comments posted by other users (Zhao et al., 2014). Currently, a significant conduit for knowledge sharing is the conversation exchange among members of these OHCs. In the case of an online community, the knowledge seeker posts an open question or a request for help via a listserv or an online forum; others in the community may either offer an appropriate solution or, if unable to provide an answer, recommend someone else to help (Hara and Foon, 2007). Through this method, the members of these OHCs can acquire many benefits after joining the group. For example, seeking information in OHCs can help users perceive more support, empathy, and optimism from others (Nambisan, 2011). People with serious diseases, such as cancer, can fight their negative feelings because the levels of pressure, depression, and psychological trauma from their health conditions can be reduced after OHC participation (Winzelberg et al., 2003; Beaudoin and Tao, 2008). Moreover, the increase in the demand for health information can lead to the development of tools, which can help users search information more easily and efficiently in return (Nambisan, 2011). Despite increasing measures adopted by online community operators, knowledge contribution continues to be inadequate in OHCs (Ye et al., 2015). Currently, problems regarding knowledge contribution in OHCs hinder facilitators from playing their part.

Knowledge-sharing behaviors in OHCs are affected by community-related factors and personal traits (Anderson, 2004; Hara and Foon, 2007; Ye et al., 2015; Shen et al., 2018). It is found that not only users' perceived community support but also their perceived leader support are positively related to their knowledge contribution (Anderson, 2004; Ye et al., 2015). Some other factors also contribute to facilitating knowledge sharing within the online community, such as self-selection, noncompetitive environment, and the asynchronous nature of the online communication platform (Hara and Foon, 2007). Perceived benefits are believed to directly contribute to individuals' information sharing. Apart from the expectation of users to acquire information from other members, another important aspect of OHC participation is that members pursue spiritual enjoyment, satisfaction, and respect from others. However, perceived risks of privacy, time, energy, and money may lower the level of users' knowledge sharing behavior. Therefore, a secure and user-friendly interaction environment, convenient and fast technology, and effective rewarding mechanisms are significant to enhance the knowledge sharing activities of OHCs (Shen et al., 2018). Moreover, personal outcome expectations also greatly influence knowledge sharing behavior. Once members believe that they can get along better with others by sharing their knowledge, they will be more willing to do so (Bock et al., 2005). Numerous studies have examined the behaviors of knowledge contribution or knowledge sharing in OHCs, in which psychological factors play a very important role. Among them, psychological contracts have been proposed by some researchers. Research on psychological contracts and knowledge sharing by Lan et al. (2020) shows that technical personnel contracts, explicit knowledge sharing, development contracts, and tacit knowledge sharing mutually influence one another—positively or negatively.

Affective commitment plays a mediating role in the relationship between the four aspects (Lan et al., 2020).

Psychological contracts involve two major types, namely, transactional and relational contracts (Robinson et al., 1994). Transactional psychological contracts are mainly formed on the basis of monetary or economic aspects with little emotional involvement, thereby leading to low members' identification and spontaneous contribution to the organization (Restubog et al., 2010; Gupta et al., 2012). In contrast, relational psychological contracts, formed based on long-term social cohesiveness, are positively related to members' perceived trust and sense of belonging toward the organization, and in turn result in high willingness to contribute knowledge (Abdullah et al., 2011; Riikka and Läms, 2014). However, most of the research on psychological contracts and knowledge contributions has mainly focused on offline organizations. As a result, few studies are concerned about the significance of psychological contracts on knowledge sharing in virtual organizations. Rousseau (1995) stated that psychological contracts are one's belief, shaped by the organization, with regard to the terms of an exchange arrangement between the individual and their organization. The influences of psychological contracts on members' contributions are of great research value, and their significant role in practical outcomes in the virtual community has also been proposed by scholars (Pirkkalainen et al., 2018; Wei et al., 2018; Bi, 2019). Thus, this study carried out a series of systematic and in-depth investigations in the OHC context.

The objective of our research is to explore the effect of users' psychological contracts on their knowledge contribution in OHCs. The rest of this paper is organized as follows. First, we present the hypotheses and the conceptual model based on the base of our reviewed literature. Second, the measures used in the investigation and some of the data collection procedures are introduced. Then, we illustrate the data analysis techniques and report the results. The theoretical and practical implications of the findings as well as the limitations of this study are disclosed in the final section.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Online Health Communities (OHCs) and Psychological Contract Theory

OHC users conduct activities, such as knowledge sharing and member exchanges, on health- or treatment-related issues in the community (Demiris, 2006). By allowing patients to communicate directly with one another, these communities provide an easier and more accessible means of obtaining health information. In recent years, extensive research has been conducted on online health communities. Specifically, users' information search behavior, users' continuous participation behavior, as well as behavior related to user health management in OHCs have drawn a lot of attention (Lin et al., 2015a; Mou et al., 2017; Zhang et al., 2017). Nevertheless, the most common form of activity carried out by participants in online communities is "knowledge sharing" (Hara and Foon, 2007). The information obtained in OHCs can be used by patients to understand

their diseases and treatment opinions. Healthy people can also use such information for health risk assessment and disease prevention. Out of consideration of potential threats to online health information, users tend to hide their health-related information. However, the continued growth and prosperity of the OHC depends on whether its members are open and willing to share their personal knowledge (Hui et al., 2007). Therefore, many scholars are concerned about the reasons and incentive mechanisms of knowledge-sharing behaviors in OHCs. It is believed that reciprocity, knowledge self-efficacy, and altruism have positive effects on knowledge sharing intention among health professionals and normal users in OHCs (Zhang et al., 2017). Kuo and Ranganathan (2013) presented a conceptual model of knowledge contribution in OHCs drawing upon three primary factors: individual personality, context, and structural features of the community. In addition to these motivators, self-expression, online reputation, affiliation, sense of belonging, and social capital have been suggested to be key motivators for online knowledge contribution (Chiu et al., 2006; Ma and Agarwal, 2007). The concept of the psychological contract was also used to understand the connection between individual-organization relationships and knowledge contribution motivation (Riikka and Läms, 2014).

A psychological contract refers to an “unwritten contract” that exists between an employee and his/her organization, involving their mutual and implicit expectations from each other (Levinson et al., 1962). Argyris (1960) explored an informal tacit relationship between workers and foremen. His work is the earliest study on psychological contracts. Although he proposed the concept of a psychological work contract, he did not provide its exact definition. On this basis, Rousseau (1990) redefined the early concept of psychological contracts, proposing that the psychological contract is the individual's understanding and belief in the mutual obligations of the employee and the organization; it is also the employee's external and internal contribution. Thus, the psychological contract is an understanding and perception of the exchange relationship between personal contribution and organizational commitments (Rousseau, 1990). MacNeil (Macneil, 1985) first proposed that the psychological contract in an organization includes two components: transactional and relational. Later, Robinson et al. (1994) extracted them as the two dimensions of the psychological contract: transactional dimension and relational dimension. In Riikka's (Riikka and Läms, 2014) research, psychological contracts have been proven useful for finding the best possible method to stimulate the intrinsic motivation of knowledge sharing. Members' psychological contracts are also found strongly related to their participation in the knowledge collaboration in virtual community (Wei et al., 2018; Bi, 2019). However, the impact of psychological contracts on knowledge contribution in OHCs has rarely been investigated despite its important practical significance.

Psychological Contracts and Knowledge Contribution

Transactional psychological contracts generally emphasize economic, monetary, and materialistic aspects, which comprise

factors based on economic exchange (Millward and Hopkins, 1998; Raja et al., 2004; Wei et al., 2018). It describes obligations that are economic and extrinsic, which are more specific and short-term (Gupta et al., 2012). For example, in a company, an employee experiencing a transactional psychological contract is more likely to perceive his/her organization as a source of income and a place to work (Millward and Hopkins, 1998). Researchers have found that transactional psychological contracts, which are highly monetary or materialistic in focus with little close involvement of the parties, do not help facilitate knowledge sharing (Gupta et al., 2012). Moreover, in some enterprises, the situation of knowledge collaboration when most people have transactional psychological contracts is not that active. In the virtual community, the transactional psychological contract dimension refers to a member's self-interest rather than the interest of the whole virtual society (Wei et al., 2018).

Relational psychological contracts mainly depend on trust, loyalty, and job security, which encompass factors based on long-term social cohesiveness (Riikka and Läms, 2014). In addition, it is based on socioemotional exchange and has an open-ended membership involving extensive investments by both parties based on confidence, stability, and high commitment (Taylor et al., 2006). Similar to transactional psychological contracts, relational contracts have special influences on the behavior of people. According to Gupta et al. (2012), relational psychological contracts positively influence knowledge-sharing behavior. The practical implication of this finding is that if an organization expects the engagement of its employees in knowledge sharing, it is vital to facilitate them to build relational psychological contracts with the organization (Gupta et al., 2012). Another study pointed out that relational psychological contracts do not have direct effects on the behavior of knowledge sharing. Specifically, relational psychological contracts are positively related to trust and collaboration, while trust and collaboration are positively related to knowledge sharing. As a result, relational contracts have positive effects on knowledge sharing through trust and collaboration (Abdullah et al., 2011).

In light of these studies, we suppose that these two types of psychological contracts also influence individuals' behavior of knowledge contribution in OHCs and establish the following hypotheses:

Hypothesis 1 (H1). Transactional psychology contracts negatively affect knowledge contribution.

Hypothesis 2 (H2). Relational psychology contracts positively affect knowledge contribution.

Mediating Effect of Community Identification

Recently, organizations have become increasingly complex and boundless. With this trend, organizational identification is now viewed as an important intrinsic factor for members to increase cohesion and an essential element of organizational success (Smidts et al., 2000; Epitropaki, 2013). Employees who have a strong sense of organizational identification are more inclined to show supportive attitudes toward the organization, and they make their own decisions consistent with the whole

organization's objectives (Ashforth and Mael, 1989; Smidts et al., 2000). Companies have recognized that organizational identification has a significant impact on employees' work outcomes, such as job engagement, organizational citizenship behavior, and job performance (Cooper and Thatcher, 2010; Epitropaki, 2013). Moreover, organizational identification is consonant to the belongingness dimension of individuals' perceived organizational membership, that is, to the perception that one has devoted oneself to becoming a member of the organization and a sense of perceived acceptance by the group (Masterson and Stamper, 2003; Epitropaki, 2013).

Rousseau and Tijoriwala (Rousseau and Tijoriwala, 1998) highlighted the dynamic interaction between psychological contracts and organizational identification in their study. Soon afterward, Masterson and Stamper (Masterson and Stamper, 2003) and Stamper et al. (2009) interpreted both constructs within an integrated conceptual framework, which is conceptualized as "perceived organizational membership." They further suggested perceived organizational membership to be an integrated multidimensional construct reflecting employees' perceptions of their relationship with their organization. Within this framework, psychological contracts have been verified to facilitate employees' perceptions of organizational membership through their perceptions of need fulfillment, whereas organizational identification is consonant to the belongingness dimension of perceived organizational membership (Epitropaki, 2013).

Moreover, psychological contract fulfillment is a crucial predictor of employee satisfaction and organizational identification; specifically, perceptions of psychological contract fulfillment are positively related to organizational identification and job satisfaction. In contrast, psychological contract breach has a negative impact on these outcomes (Rodwell et al., 1971). Similarly, studies also revealed that psychological contract fulfillment has a positive impact on perceived organizational support and thereby may be linked to organizational identification and organizational citizenship behaviors (OCBs) (Zagenczyk et al., 2011; Ahmad and Zafar, 2018). However, in regard to the specific dimension, transactional psychological contracts have a negative effect on both in-role and extra-role performance, which means decreased work engagement, reduced job satisfaction and job commitment, low identification, and high intention to quit (Lu et al., 2016). On the other hand, they also found that relational psychological contracts contribute to higher organizational identification as well as OCBs. Similar results were reflected in the study of Tufan and Wendt (Tufan and Wendt, 2020). They employed a perspective of psychological contract breach and determined that relational psychological contract breach reduces ethnic minority employees' organizational citizenship behavior by damaging their employment relationships and causes these employees to dissociate their identity from that of the organization (Tufan and Wendt, 2020).

Given that all these studies are related to offline organizations, online organizations and communities have rarely been investigated. Drawing on the above literature, we suppose

that the two types of psychological contracts have significant influences on community identification in OHCs and set up the following hypotheses:

Hypothesis 3 (H3). Transactional psychology contracts negatively affect community identification.

Hypothesis 4 (H4). Relational psychology contracts positively affect community identification.

Community members actively participate in community activities when they identify with the community (Algesheimer et al., 2005). Tidwell (2005) demonstrated that people increase their contributions if they strongly identify with an organization. Wasko and Faraj (2005) explained that people feel obligated to help others because they have a common membership when they identify with a group. Group identification positively influences knowledge-sharing behavior in the community. Moreover, numerous studies have indicated that if members stay in contact with the community psychologically, they are more inclined to behave in terms of their community sake (Bergami and Bagozzi, 2000; Gruen et al., 2000; McWilliam, 2000). In a virtual community, when members accept its culture and values and identify with the community, they acquire a sense of belonging and trust and are more willing to share knowledge in the community. For example, members of a travel community with high identification are more willing to participate in community events to exchange information, opinions, and experiences with others (Ardichvili et al., 2003; Koh and Kim, 2004). van den Hooff et al. (2003) supported this claim by stating that in knowledge communities, members are more likely to share knowledge when they identify strongly with the group. Other studies have also verified that community identification is positively related to knowledge-sharing behavior in the virtual community (Nahapiet and Ghoshal, 1998; Chiu et al., 2015). Moreover, some research has discussed the mediating role of identification. Qu and Lee (2011) demonstrated that participating in the community can enhance users' community identification and promote knowledge sharing via community identification. Restubog et al. (2010) determined that organizational identification plays a mediating role in the relationship between psychological contract breach and organizational citizenship behavior. For OCBs, Ramasamy and Thamaraiselvan (2011) proposed a conceptual framework in which the five components of OCBs are closely linked to spontaneous behaviors and are positively related to knowledge sharing. On the basis of previous studies, we speculate that some underlying mechanisms exist between psychological contracts and knowledge contribution via community identification. This study sets up the following hypotheses:

Hypothesis 5 (H5). Community identification has a positive effect on knowledge contribution.

Hypothesis 6a (H6a). Community identification plays a mediating role in the relationship between transactional psychology contracts and knowledge contribution.

Hypothesis 6b (H6b). Community identification plays a mediating role in the relationship between relational psychology contracts and knowledge contribution.

Moderating Effect of Knowledge Sharing Self-Efficacy

Knowledge sharing self-efficacy refers to knowledge contributors' confidence regarding whether they have enough ability to provide valuable knowledge to other members (Ye et al., 2015). When community members have high knowledge sharing self-efficacy, they believe they can provide useful information and valuable knowledge. Thus, the users in this community can be more willing to contribute knowledge to the community. Studies have revealed that knowledge sharing self-efficacy has a positive effect on knowledge contribution (Liou et al., 2016; Yilmaz, 2016; Zhang et al., 2017). For example, Hsu et al. (2007) pointed out that individuals' knowledge sharing self-efficacy is positively related to their knowledge-sharing behavior. A low level of perceived knowledge sharing self-efficacy can be a significant obstacle to knowledge contribution behavior because people may doubt whether they have sufficient ability to share information (Hsu et al., 2007). Within the context of OHCs, knowledge self-efficacy is believed to have a more significant influence on the knowledge contributing intention of health professionals than of patient users (Zhang et al., 2017). With the popularity of the Internet, many normal users can use different sources through website links to obtain information and share health knowledge with others (Zhang and Sun, 2015). According to Alessandri et al. (2009), compared to those with low self-efficacy, individuals with a high level of self-efficacy are more inclined to provide support to others and even not hesitate to make certain sacrifices to enact such prosocial behaviors. Rather than the return from their contribution, they fulfill their needs for esteem, self-actualization and even subjective well-being by their contributing behavior (Chiu et al., 2015). Based on the above literature, this study suggests that knowledge sharing self-efficacy can weaken the negative influence of transactional psychological contracts on individuals' knowledge contribution. That is, knowledge sharing self-efficacy negatively moderates the relationship between transactional psychological contracts and knowledge contribution. On the other hand, community members who perceive an emotional connection and a sense of belonging to the community and other members are more inclined to contribute for the sake of the community, and to help other members (Utz and Sassenberg, 2002). Moreover, if they believe themselves to have the capability to help others, they will be more active in contributing their knowledge. Given this, we believe that knowledge sharing self-efficacy positively moderates the relationship between relational psychological contracts and knowledge contribution. Meanwhile, individuals who feel capable of coping with challenges will show a strong intention to offer support to others for the sake of community identification. That is, community identification will have a stronger effect on knowledge contribution for individuals with high self-efficacy than for those with low self-efficacy (Lin et al., 2015b). Therefore, this study suggests that knowledge sharing self-efficacy positively moderates the relationship between community identification and knowledge contribution. To sum up, we propose the following hypotheses:

Hypothesis 7a (H7a). Knowledge sharing self-efficacy negatively moderates the influence of transactional psychological contracts on knowledge contribution.

Hypothesis 7b (H7b). Knowledge sharing self-efficacy positively moderates the influence of relational psychological contracts on knowledge contribution.

Hypothesis 7c (H7c). Knowledge sharing self-efficacy positively moderates the influence of community identification on knowledge contribution.

RESEARCH DESIGN AND METHODOLOGY

Measurement

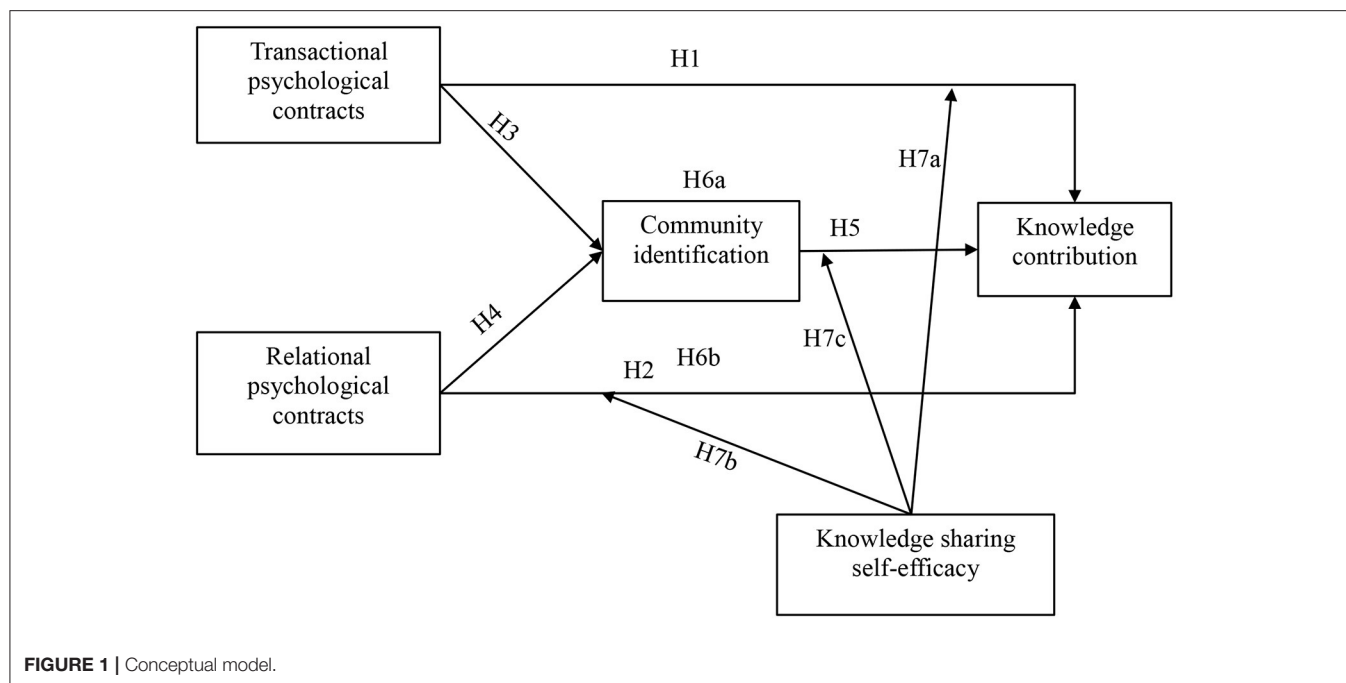
A questionnaire is developed for data collection, which consists of scales to measure all the constructs of the research model (Figure 1) and demographic characteristics. All the items for measuring the constructs were adopted from the existing literature and adjusted to fit our OHC context.

We adapted items for psychology contracts from the studies of Soares and Mosquera (2019) and Lu et al. (2016) and modified them on the basis of the concept of psychological contracts in the virtual community context by Wei et al. (2018). The measures of community identification were adapted from Wang and Wei (2011). A sample question is "I feel a sense of belonging to my virtual community." In addition, we adapted items for knowledge sharing self-efficacy from Kankanhalli et al. (2005). Knowledge contribution was measured by three questions adopted from Ye et al. (2015). A sample question is "I have confidence in responding or adding comments to messages or articles posted by other members in the online health community." Following the approaches used by Soares and Mosquera (2019), the responses to the questions about transactional psychology contracts were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and relational psychology contracts were measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In accordance with Wang and Wei (2011), the responses to the questions about community identification were rated on a five-point Likert scale. Following the approaches used by Kankanhalli et al. (2005) and Ye et al. (2015), knowledge sharing self-efficacy and knowledge contribution were measured on a seven-point Likert scale. Table 1 shows the measures for all constructs.

Survey Administration

Research data were collected among the users of several main Chinese OHCs, such as Dingxiangyuan (<http://www.dxy.cn/bbs/index.html>) and Manyoubang (<http://www.manyoubang.com>), from June to August 2020. A total of 491 registered users of these websites participated in the survey. With the exclusion of 129 invalid questionnaires, a total of 362 complete and valid questionnaires were used for data analysis. Table 2 shows the demographic statistics of the respondents.

Among the respondents, 56.9% were female, and 43.1% were male, and the participants ranged in age from teenagers to individuals over 60 years old. Regarding education level, 80.9% of the respondents had a bachelor's degree. The proportion of

**TABLE 1 |** Research constructs and measurements.

Construct	Items	Source
Transactional Psychological Contracts (TPC)	TPC1 I am under no obligation to remain with this online health community. TPC2 I participate in community interaction to obtain the information I need. TPC3 I only perform specific duties I had agreed to when I joined TPC4 I spend more energy on answering questions with rewards.	Wei et al., 2018; Soares and Mosquera, 2019
Relational Psychological Contracts (RPC)	RPC1 I feel part of a team in this online health community. RPC2 I expect to grow in this online health community. RPC3 I commit myself personally to this online health community. RPC4 I feel that this online health community reciprocates the effort put in by its members.	Lu et al., 2016; Soares and Mosquera, 2019
Community Identification (CI)	CI1 I feel a sense of belonging to my virtual community. CI2 I am glad that I joined my virtual community for knowledge contribution purposes. CI3 I have a strong positive feeling toward my virtual community. CI4 I am proud to be a member of my virtual community.	Wang and Wei, 2011
Knowledge Sharing Self-efficacy (KSS)	KSS1 I have confidence in my ability to provide knowledge that other members in the online health community consider valuable. KSS2 I have the expertise, experiences, and insights needed to provide knowledge that is valuable for other members in the online health community. KSS3 I have confidence in responding or adding comments to messages or articles posted by other members in the online health community.	Kankanhalli et al., 2005
Knowledge Contribution (KC)	KC1 I help other people in this online health community who need help/information from other members. KC2 I take an active part in helping others in this online health community KC3 I contribute knowledge to this online health community KC4 I contribute knowledge to other members that may result in their development of new insights	Ye et al., 2015

participants who had been using the OHC for <3 months, 3–6 months, and 6 months to 1 year was approximately one-quarter each; 14.4% had been part of the community for 1–2 years, and 10.5% had participated in the community longer than 2 years. Regarding the frequency of OHC usage, 26.5% of the respondents had used OHCs a few times a month, and 24.9% of the respondents had used OHCs once a month. A very small

percentage of respondents used it less than once a month (7.5%) or several times a day (9.1%).

Measurement Assessment

SmartPLS 3.0 was used to evaluate the measurement validity and reliability. Compared with other data analysis software, SmartPLS has some advantages. First, PLS estimates the

TABLE 2 | Result of demographic statistics analysis ($N = 362$).

Demographic Profile	Category	Frequency	Percent (%)
Gender	Male	156	43.1
	Female	206	56.9
Age	Less than 19	21	5.8
	20–29	134	37.0
	30–39	150	41.4
	40–49	44	12.2
	50–59	11	3.0
	60 or above	2	0.6
Education	Education High school or below College	32	8.8
	University	293	80.9
	Graduate school or above	37	10.2
Duration	Less than 3 months	91	25.1
	3–6 months	90	24.9
	6 months to 1 year	91	25.1
	1–2 years	52	14.4
	2 years or above	38	10.5
Frequency	Less than once a month	27	7.5
	Once a month	90	24.9
	A few times a month	96	26.5
	A few times a week	69	19.1
	About once a day	47	13.0
	Several times a day	33	9.1

measurement and structural models simultaneously (Gefen et al., 2000). Second, PLS avoids inadmissible solutions and factor indeterminacy. It is suitable for testing complicated relationships (Sun et al., 2016).

We analyzed the reliability and validity of the constructs. The reliability of a construct refers to the degree of internal consistency among the instrumental items (Straub et al., 2004). Reliability can be tested by combining two indicators: composite reliability (CR) and Cronbach's α . A high value of these two indicators entails high internal consistency between the variables of the items, thus indicating higher reliability. In general, the CR value and Cronbach's α should be >0.7 (Straub et al., 2004). As shown in **Table 3**, the Cronbach's α of all constructs are between 0.802 and 0.906, which are greater than the recommended value of 0.7. The CR values are between 0.870 and 0.934, which are also greater than the benchmark value of 0.7. Therefore, the constructs involved in this study had good credibility.

The validity of the construct refers to the degree to which the items can accurately measure the construct that needs to be measured (Straub et al., 2004). Validity includes convergent validity and discriminant validity. Convergent validity can be tested by two indicators: average variance extracted (AVE) and factor loading. The AVE must be >0.5 , and the factor loading must be greater than the benchmark value of 0.7 (Straub et al., 2004). As shown in the table, the AVE values of all constructs are between 0.626 and 0.781, which are greater than the benchmark value of 0.5. The factor loading values of all constructs are

TABLE 3 | Test results of internal reliability and convergent validity.

Construct	Items	Cronbach's Alpha	Convergent Validity		
			Factor Loading	CR	AVE
TPC	TPC1	0.906	0.858	0.934	0.781
	TPC2		0.890		
	TPC3		0.873		
	TPC4		0.912		
RPC	RPC1	0.826	0.843	0.884	0.656
	RPC2		0.777		
	RPC3		0.828		
	RPC4		0.790		
CI	CI1	0.802	0.759	0.870	0.626
	CI2		0.809		
	CI3		0.772		
	CI4		0.823		
KSS	KSS1	0.829	0.879	0.897	0.745
	KSS2		0.843		
	KSS3		0.866		
KC	KC1	0.834	0.834	0.889	0.667
	KC2		0.805		
	KC3		0.800		
	KC4		0.828		

TPC, Transactional Psychological Contracts; RPC, Relational Psychological Contracts; CI, Community Identification; KSS, Knowledge Sharing Self-efficacy; KC, Knowledge Contribution.

between 0.759 and 0.912, which are greater than the benchmark value of 0.7. In summary, all the constructs in this study have good convergent validity.

Discriminant validity refers to the degree of difference between multiple variables. It can be judged by the following two criteria. First, the square root of the AVE of each construct is compared with the correlation coefficient of other constructs. Second, the loading of each construct on its corresponding factor is compared with the loading of the cross factor on other factors. As shown in **Table 4**, the square roots of the AVE of all constructs are greater than the correlation coefficient between each construct and other constructs, indicating that the research model has good discriminant validity (Fornell and Larcker, 1981). Moreover, the loadings of all constructs on their corresponding factors exceeded the cross-loading on other factors (shown in **Table 5**), thus confirming the discriminant validity of the research model (Hair et al., 2003).

Potential biases resulting from common-method variance (CMV) may exist since self-reported data were used in this study. To rule out CMV, Harman's single-factor test was used to analyze the variance proportion of a single factor. The basic assumption of Harman's single-factor test is that one general factor will account for the majority (50%) of the covariance among the measures (Podsakoff et al., 2003). The results show that the first extracted component, with the largest eigenvalue, explains 31.06% of all variance, suggesting that CMV is not an issue in this study.

STRUCTURAL MODEL RESULTS

A structural equation modeling analysis is conducted on SmartPLS 3.0 to test the relationships in the research model. SmartPLS does not provide information about fitness indices of the entire model but presents the R-square of each dependent variable. The R-square of CI is 0.437, indicating that the variation

TABLE 4 | Correlations among constructs.

Construct	Mean	S.D.	TPC	RPC	CI	KSS	KC
TPC	3.64	0.90	0.884				
RPC	5.45	1.02	−0.398	0.810			
CI	3.95	0.69	−0.451	0.622	0.791		
KSS	5.24	1.14	−0.313	0.394	0.399	0.863	
KC	5.50	1.01	−0.529	0.515	0.547	0.612	0.817

Diagonal elements are square roots of AVEs. TPC, Transactional Psychological Contracts; RPC, Relational Psychological Contracts; CI, Community Identification; KSS, Knowledge Sharing Self-efficacy; KC, Knowledge Contribution.

TABLE 5 | Item cross-loadings.

Items	TPC	RPC	CI	KSS	KC
TPC1	0.858	−0.385	−0.423	−0.295	−0.526
TPC2	0.890	−0.354	−0.395	−0.227	−0.402
TPC3	0.873	−0.320	−0.385	−0.285	−0.427
TPC4	0.912	−0.342	−0.388	−0.293	−0.500
RPC1	−0.315	0.843	0.561	0.391	0.492
RPC2	−0.316	0.777	0.477	0.301	0.394
RPC3	−0.329	0.828	0.496	0.293	0.380
RPC4	−0.333	0.790	0.475	0.280	0.392
CI1	−0.283	0.454	0.759	0.260	0.324
CI2	−0.351	0.463	0.809	0.331	0.441
CI3	−0.315	0.522	0.772	0.286	0.386
CI4	−0.453	0.525	0.823	0.370	0.546
KSS1	−0.314	0.327	0.348	0.879	0.505
KSS2	−0.253	0.360	0.369	0.843	0.517
KSS3	−0.247	0.333	0.319	0.866	0.558
KC1	−0.447	0.454	0.472	0.504	0.834
KC2	−0.420	0.412	0.423	0.492	0.805
KC3	−0.428	0.383	0.413	0.491	0.800
KC4	−0.434	0.433	0.476	0.512	0.828

TPC, Transactional Psychological Contracts; RPC, Relational Psychological Contracts; CI, Community Identification; KSS, Knowledge Sharing Self-efficacy; KC, Knowledge Contribution.

that can be explained is 43.7%. The R-square of KC is 0.677, indicating that the variation that can be explained is 67.7%. The result presents a good model fit. **Figure 2** presents the path coefficients between each pair of constructs in the structural model. The figure also shows the results of the structural path analysis. The fitness of the overall model is fairly good.

As shown in **Figure 2**, the path coefficient between transactional psychological contracts and knowledge contribution ($\beta = -0.246, p < 0.001$) is negatively significant, thereby supporting Hypothesis 1. The path coefficient between relational psychological contracts and knowledge contribution is positively significant ($\beta = 0.295, p < 0.001$), which supports Hypothesis 2. In addition, the path coefficient between transactional psychological contracts and community identification ($\beta = -0.242, p < 0.001$) is negatively significant, whereas the path coefficient between relational psychological contracts and community identification ($\beta = 0.526, p < 0.001$) is positively significant, thereby validating Hypothesis 3 and Hypothesis 4. The significant positive path coefficient between community identification and knowledge contribution ($\beta = 0.190, p < 0.001$) supports Hypothesis 5.

Prior studies have suggested that psychological contracts can lead to employees' community identification, thereby motivating

their knowledge contribution behaviors (Liu et al., 2020). Given this, our study examines how community identification mediates the relationship between psychological contracts and knowledge contribution by using a bootstrapping method to verify the mediation effect. Using the bootstrapping method in SmartPLS to run 5,000 times, the level value under 95% confidence is shown in the following table.

Table 6 reveals that transactional psychology contracts have a relatively significant indirect effect ($\beta = -0.046, p < 0.001$) on knowledge contribution via community identification, thereby supporting Hypothesis 6a. In addition, relational psychology contracts have a significant indirect effect ($\beta = 0.100, p < 0.001$) on knowledge contribution via community identification, thus supporting Hypothesis 6b.

Hypotheses 7a and 7b propose the moderating effects of knowledge sharing self-efficacy on the relationships between psychological contracts and knowledge contribution. The results in **Table 7** show that the interaction between transactional psychological contracts and self-efficacy is insignificant ($\beta = 0.122, p > 0.05$; **Figure 3**). However, the interaction between relational psychological contracts and knowledge sharing self-efficacy is significant ($\beta = 0.217, p < 0.001$; **Figure 4**). Thus, H7b is supported, but H7a is rejected.

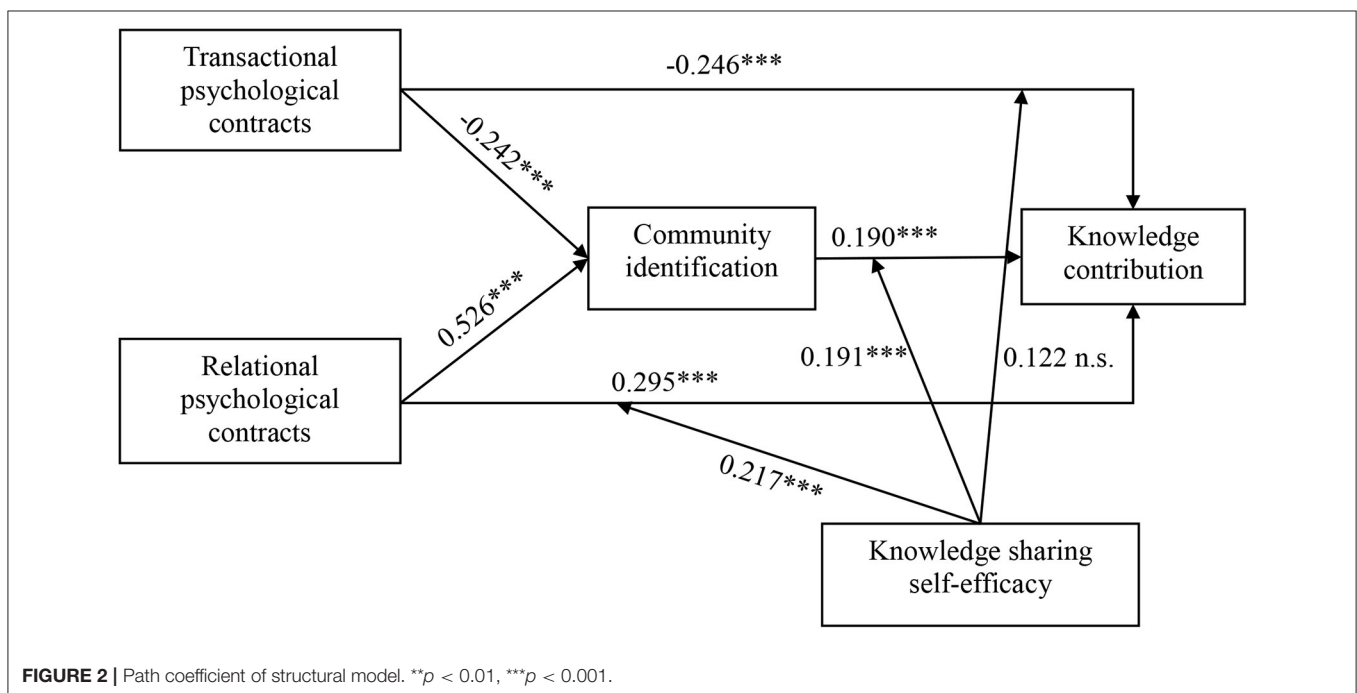


TABLE 6 | Mediating effects of organizational identification.

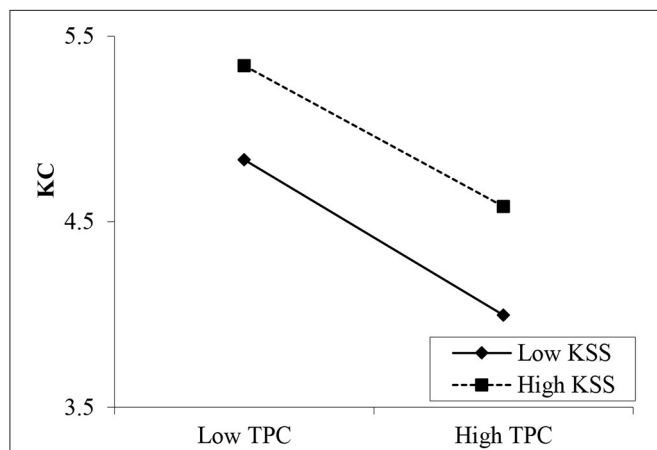
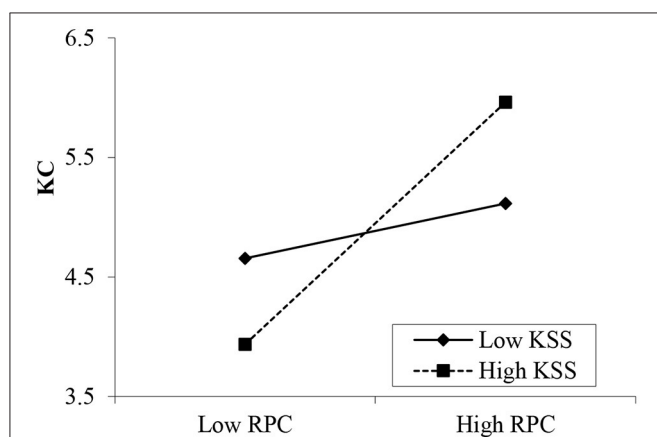
Path	β	STDEV	T	P	Confidence Intervals	
					2.5%	97.5%
RPC → CI → KC	0.100	0.025	3.978	0.000	0.057	0.157
TPC → CI → KC	-0.046	0.014	3.366	0.001	-0.077	-0.023

TPC, Transactional Psychological Contracts; RPC, Relational Psychological Contracts; CI, Community Identification; KC, Knowledge Contribution.

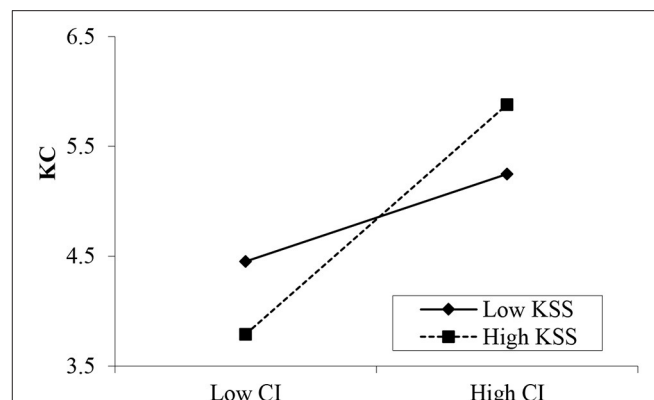
TABLE 7 | Moderating effects of knowledge sharing self-efficacy.

Path	β	STDEV	T	P
CI*KSS -> KC	0.191	0.051	3.774	0.000
RPC*KSS -> KC	0.217	0.063	3.444	0.001
TPC*KSS -> KC	0.122	0.080	1.518	0.129

TPC, Transactional Psychological Contracts; RPC, Relational Psychological Contracts; CI, Community Identification; KSS, Knowledge Sharing Self-efficacy; KC, Knowledge Contribution.

**FIGURE 3 |** Moderating effect of knowledge sharing self-efficacy (KSS) between transactional psychological contracts (TPC) and knowledge contribution (KC).**FIGURE 4 |** Moderating effect of knowledge sharing self-efficacy (KSS) between relational psychological contracts (RPC) and knowledge contribution (KC).

Moreover, the interaction between community identification and self-efficacy was significant ($\beta = 0.191, p < 0.001$, **Figure 5**). Therefore, Hypothesis 7c is supported.

**FIGURE 5 |** Moderating effect of knowledge sharing self-efficacy (KSS) between community identification (CI) and knowledge contribution (KC).

DISCUSSION

This study explores the influence of two types of psychological contracts between community members and OHCs on knowledge contribution. It also examines the mediating role of community identity and the moderating role of knowledge self-efficacy.

The structural equation modeling method is adopted to examine the theoretical hypotheses. The test results show that the two types of psychological contracts play different roles in online health community members' knowledge contribution. Specifically, transactional psychological contracts have a significantly negative impact on knowledge contribution, whereas relational psychological contracts have a positive impact on knowledge contribution. These results echo the findings of previous studies that focused on offline organizations (Turnley et al., 2003; Lu et al., 2016; Soares and Mosquera, 2019). By investigating frontline hotel employees, Lu et al. (2016) found that relational psychological contracts are more effective in motivating employees' high performance. In contrast, transactional psychological contracts are negatively related to employees' in-role and extra-role performance. Similar results were also obtained with samples from nonprofit organizations. Soares and Mosquera (2019) investigated members from military departments and found that members who experience a relational psychological contract have high work engagement, while those who experience a transactional psychological contract have low work engagement. These findings also confirmed the argument of Turnley et al. (2003), who proposed and clarified that psychological contract fulfillment regarding relationships is positively related to employees' performance. In short, the findings of this study demonstrate that both the negative impact of transactional contracts and the positive impact of relational contracts on individuals' performance also exist in online health communities. Compared to transactional psychological contracts, relational psychological contracts play a positive role in members' knowledge contribution.

Furthermore, the two dimensions of psychological contracts affect knowledge contribution through community identification. Community members who originally only pay attention to or are mainly concerned about the exchange of benefits rarely develop a sense of belonging and loyalty to the community, which is not conducive to inspiring the willingness to contribute their knowledge. However, individuals' relational psychological contract contributes to the formation of their community identification and thereby plays a positive role in their knowledge contribution. This result is similar to those of previous studies (Bergami and Bagozzi, 2000; van den Hooff et al., 2003; Chiu et al., 2015; Lu et al., 2016). For example, Lu et al. (2016) proposed and empirically examined that organizational identification is a critical psychological factor that translates psychological contracts into individuals' behavior. Nevertheless, this study is distinct from prior studies. Unlike the construct of transactional psychological contract that emphasizes the unwritten agreement of exchanges based on monetary or materialistic drivers in prior studies, the transactional psychological contract in this study focuses on the exchange of information, knowledge, and help. The findings of this study indicate that knowledge acquisition motivation and obligation to provide help or knowledge to others neither help cultivate OHC users' community identification nor lead to high intention to contribute knowledge. Similarly, the relational psychological contract is measured with items that are unlike those used in studies that investigate offline organizations. Traditional relational psychological contracts are formed and developed on the basis of real-world interactions, such as interactions among organization members or between individuals and an organization. By contrast, the relational psychological contract in this study emphasizes the virtual relationships in online communities, which are positively related to individuals' community identification. Hence, this study broadens the application context of psychological contracts by introducing it from offline organizations to online organizations. In conclusion, although the measurements of psychological contract vary, the influence mechanism of psychological contracts on members' attitude and behavior is the same.

In addition, we found that knowledge sharing self-efficacy has a positive moderating effect on the path of relational psychological contracts to knowledge contribution. It also has a positive effect on the influence of community identification on knowledge contribution. However, no significant moderating effect exists on the influence path of the transactional psychological contract on the contribution of knowledge. That is to say, knowledge-sharing self-efficacy has a positive interactional effect with affective factors, such as relational psychological contract and community identification, on individuals' OCBs. However, it does not change the negative impact of transactional psychological contracts.

Theoretical Significance of Research Results

This study generates several important theoretical contributions. First, it enriches research about psychological contracts and

knowledge contributions in OHCs. In the past, most studies situate the exploration of the relationship between psychological contracts and knowledge contribution in the context of companies (Riikka and Läms, 2014). However, with the popularization of the Internet in recent years, an increasing number of people have begun to conduct activities in virtual communities, such as SNSs, online brand communities, and online Q&A communities, which also include OHCs. In OHCs, people who have had similar experiences have a tendency to share their experiences and knowledge. Therefore, exploring the influencing factors of knowledge contribution in OHCs has important theoretical significance. This study verifies the impact of the psychological contract of the transactional dimension and relational dimension on the knowledge contribution activities of OHCs through empirical analysis, and community identification plays an intermediary role. First, transactional psychological contracts negatively affect OHC users' knowledge contribution, whereas relational psychological contracts positively affect their knowledge contribution. Second, transactional contracts are negatively related to users' community identification, whereas relational contracts lead to higher community identification, which thereby enhances users' intention to share and contribute knowledge. Previous studies have confirmed these relationships in enterprises but rarely in the context of OHCs. This study provides a new perspective to investigate OHC users' community participation.

Second, we include knowledge sharing self-efficacy into the research framework to explore its moderating effect. In terms of knowledge contribution behavior, knowledge sharing self-efficacy plays a vital role in individuals' knowledge-sharing activities. It can diversify members' knowledge-contributing behaviors (Hsu et al., 2007). Health professionals and users who are relatively knowledgeable and familiar with using information technology have reasonable confidence to provide accurate and useful medical information to others, and other patients can make health decisions on the basis of the information they obtain from the OHCs (Zhang et al., 2017). Users' high self-efficacy promotes their knowledge contribution behavior and makes them perceive achievement from their knowledge sharing behavior, especially when their knowledge can help others. Specifically, when OHC users regard themselves as members or citizens of the OHC, their knowledge sharing self-efficacy positively interacts with their relational psychological contract and community identification to devote themselves to the community. To conclude, knowledge sharing self-efficacy can enhance the effects of relational contracts and community identification on knowledge contribution.

Practical Significance of Research Results

A clear understanding of the psychological mechanisms through which knowledge contribution operates is critical to the promotion of willingness to offer contribution. Previous research suggests that by contributing a part of their unique knowledge, knowledge contributors give up sole claims to the benefits stemming from such knowledge. Methods to promote knowledge contribution must be sought. This study provides some practical ways.

First, attention must be given to the construction of relational psychological contracts. In this study, we found that relational psychological contracts have a positive effect on knowledge contribution. Thus, the managers of OHCs should establish a good communication mechanism to promote users' communication among community members. China is a society that places great emphasis on harmonious coexistence. Within such a cultural background, the key to integrating into the community, and being willing to contribute knowledge is to establish a good relationship with other members of the community. Generally, people hope to establish a friendly relationship with others and receive care, friendship, support, cooperation, and appreciation from others. In particular, in the specific virtual community of OHCs, users can meet numerous people who share similar experiences. In the process of mutual communication, empathy enables them to understand one another and produce feelings of mutual respect. In such an environment, community members learn to trust others and their community. They are also more willing to contribute their own knowledge. For example, in addition to answering and commenting on the public questions of other members in the OHCs, community members can also send private messages, likes, and give virtual gifts. They can also create different groups and circles to build a social network model to promote communication among community members.

The second method is to build a good corporate culture and values. The core of corporate culture is to share common values, which guide members' behavior. In an OHC, an atmosphere that encourages knowledge contribution can encourage community members to share and exchange their knowledge and experience more naturally. One of the purposes of community members using the OHC is to obtain insight from the experiences of people with similar cases or the knowledge provided by professionals. By combining personal goals and community goals through the construction of community culture and values, community members subtly accept and agree with the values of the community and develop a sense of belonging, loyalty, and emotional identification. In the process of communicating with others, they can take pride in contributing knowledge and creating a sense of accomplishment, which encourages community members to be willing to exchange and share knowledge continuously. Contributing their talents to common interests is also conducive to a good community atmosphere and achieving win-win cooperation.

Last, the managers of OHCs should raise their perceptions of knowledge self-efficacy. Our findings indicate that the knowledge contribution of self-efficacy plays an important role in promoting individuals' willingness to offer knowledge contribution as the expression of their identification with the community. For instance, organizations such as Amazon.com regularly recognize their top reviewers, serving as a way to enhance the self-efficacy of these knowledge contributors (Kankanhalli et al., 2005). Thus, they can deliver a message to community members who share their knowledge to make them aware that their knowledge contribution means much to OHCs.

CONCLUSION

This study investigates OHC users' knowledge contribution behavior from the perspective of psychological contracts, which has been widely discussed in other organizations but not in OHCs. Scales of transactional psychological contract, relational psychological contract, community identification, knowledge contribution, and self-efficacy are adopted from prior studies and adjusted to this study. A total of 362 valid samples from OHCs, such as Dingxiangyuan and Manyoubang, from China are used in the analysis. The reliabilities of the constructs are confirmed according to the values of composite reliability (CR) and Cronbach's α . Moreover, convergent validity is confirmed based on the factor loadings and AVEs. Meanwhile, by comparing the square root of AVE of each construct with the corresponding correlations, as well as observing the item cross-loading, the discriminant validity among constructs is confirmed. The results of the structural model test confirm our propositions on the relationships among OHC users' psychological contracts, community identification, and knowledge contribution (H1 to H6). Moreover, the moderating effects of self-efficacy in H7b and H7c are also verified. The results of this study have theoretical and practical implications. Despite the contribution of this study, some limitations exist because of the research design and process. First, this study does not analyze users' different types of psychological contracts and their community identification under various lengths of membership. The length of an individual's membership in an organization, to some extent, determines their psychological contacts with the organization (Conway and Coyle-Shapiro, 2012). In addition, long-tenured members are more committed to an organizational mission and thereby more willing to contribute to the organization (Lee et al., 2018). Thus, the role of the length of membership in the OHCs should be considered in future work. Second, OHCs are special communities in which most users are patients suffering from certain diseases. Whether they achieve health improvements after joining OHCs may also moderate the relationship between their psychological contract and knowledge contribution. Third, the responses of the participants of this study were collected from several OHCs. Rewarding or motivating systems may differ from one another and should be considered as a control variable. All the above shortcomings of this study are expected to be further investigated in future works.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Review Board of the College of Economics and Management of Nanjing University of Aeronautics and Astronautics. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

WL, XC, XL, and XF designed the study. XC and XL collected and analyzed the data, and drafted the manuscript. WL and XF contributed to manuscript revision and read and approved the submitted version. All authors contributed to the article and approved the submitted version.

REFERENCES

- Abdullah, N. L., Hamzah, N., Arshad, R., Isa, R. M., and Ghani, R. A. (2011). Psychological contract and knowledge sharing among academicians: mediating role of relational social capital. *Int. Bus. Res.* 4, 231–241. doi: 10.5539/ibr.v4n4p231
- Ahmad, I., and Zafar, M. A. (2018). Impact of psychological contract fulfillment on organizational citizenship behavior mediating role of perceived organizational support. *Int. J. Hosp. Manag.* 30, 1001–1015. doi: 10.1108/IJCHM-12-2016-0659
- Alessandri, G., Caprara, G. V., Eisenberg, N., and Steca, P. (2009). Reciprocal relations among self-efficacy beliefs and prosociality across time. *J. Pers.* 77, 1229–1259. doi: 10.1111/j.1467-6494.2009.00580.x
- Algesheimer, R., Dholakia, U. M., and Herrmann, A. (2005). The social influence of brand community: evidence from european car clubs. *J. Mark.* 69, 19–34. doi: 10.1509/jmk.69.3.19.66363
- Anderson, B. (2004). Dimensions of learning and support in an online community. *Open Learn Open J. Distance e-Learn* 19, 183–190. doi: 10.1080/0268051042000224770
- Ardichvili, A., Page, V., and Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *J. Knowl. Manag.* 7, 64–77. doi: 10.1108/13673270310463626
- Argyris, C. (1960). *Understanding Organizational Behavior*. Homewood, IL: The Dorsey Press.
- Ashforth, B. E., and Mael, F. (1989). Social identity theory and the organization. *Acad. Manage. Rev.* 14, 20–39. doi: 10.5465/amr.1989.4278999
- Beaudoin, C. E., and Tao, C. C. (2008). Modeling the impact of online cancer resources on supporters of cancer patients. *New Media Soc.* 10, 321–344. doi: 10.1177/1461444807086477
- Bergami, M., and Bagozzi, R. P. (2000). Self-categorization, affective commitment and group self-esteem as distinct aspects of social identity in the organization. *Br. J. Soc. Psychol.* 39, 555–577. doi: 10.1348/014466600164633
- Bi, Q. (2019). Cultivating loyal customers through online customer communities: a psychological contract perspective. *J. Bus. Res.* 103, 34–44. doi: 10.1016/j.jbusres.2019.06.005
- Bock, G., Zmud, R., Kim, Y., and Lee, J. (2005). Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, organizational climate. *MIS Q.* 29, 87–111. doi: 10.2307/25148669
- Chiu, C., Hsu, M., and Wang, E. T. G. (2006). Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories. *Decis. Support Syst.* 42, 1872–1888. doi: 10.1016/j.dss.2006.04.001
- Chiu, C., Huang, H., Cheng, H., and Sun, P. (2015). Understanding online community citizenship behaviors through social support and social identity. *Int. J. Inf. Manag.* 35, 504–519. doi: 10.1016/j.ijinfomgt.2015.04.009
- Conway, N., and Coyle-Shapiro, J. A. M. (2012). The reciprocal relationship between psychological contract fulfillment and employee performance and the moderating role of perceived organizational support and tenure. *British Psychol. Soc.* 85, 277–299. doi: 10.1111/j.2044-8325.2011.02033.x
- Cooper, D., and Thatcher, S. M. B. (2010). Identification in organizations: the role of self-concept orientations and identification motives. *Acad. Manage. Rev.* 35, 516–538. doi: 10.5465/amr.35.4.zok516
- Demiris, G. (2006). The diffusion of virtual communities in health care: concepts and challenges. *Patient Educ. Couns.* 62, 178–188. doi: 10.1016/j.pec.2005.10.003
- Epitropaki, O. (2013). A multi-level investigation of psychological contract breach and organizational identification through the lens of perceived organizational

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- membership: testing a moderated-mediated model. *J. Organ. Behav.* 34, 65–86. doi: 10.1002/job.1793
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.1177/002224378101800104
- Gefen, D., Straub, D., and Boudreau, M. (2000). Structural equation modeling and regression: guidelines for research practice. *Commun. Assoc. Inf. Syst.* 4, 7. doi: 10.17705/1CAIS.00407
- Gruen, T. W., Summers, J. O., and Acito, F. (2000). Relationship marketing activities, commitment, membership behavior. *J. Mark.* 64, 34–49. doi: 10.1509/jmk.64.3.34.18030
- Gupta, B., Agarwal, A., Samaria, P., Sarda, P., and Bucha, R. (2012). Organizational commitment & psychological contract in knowledge sharing behavior. *Indian J. Ind. Relat.* 47, 737–749. Available online at: <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=82030195&lang=zh-cn&site=ehost-live>
- Hair, J. F., Bush, R. P., and Ortinau, D. J. (2003). *Marketing Research: Within A Changing Information Environment*. Boston, MA: McGraw-Hill Education.
- Hara, N., Foon, H. K. (2007). Knowledge-sharing in an online community of health-care professionals. *Inf. Technol. People* 20, 235–261. doi: 10.1108/09593840710822859
- Hsu, M., Ju, T. L., Yen, C., and Chang, C. (2007). Knowledge sharing behavior in virtual communities: the relationship between trust, self-efficacy, outcome expectations. *Int. J. Hum. Comput. St.* 65, 153–169. doi: 10.1016/j.ijhcs.2006.09.003
- Hui, K., Teo, H. H., and Lee, S. T. (2007). The value of privacy assurance: an exploratory field experiment. *MIS* 31, 19–33. doi: 10.2307/25148779
- Kankanhalli, A., Tan, B. C. Y., and Wei, K. (2005). Contributing knowledge to electronic knowledge repositories: an empirical investigation. *MIS* 29, 113–143. doi: 10.2307/25148670
- Koh, J., and Kim, Y. (2004). Knowledge sharing in virtual communities: an e-business perspective. *Expert Syst. Appl.* 26, 155–166. doi: 10.1016/S0957-4174(03)00116-7
- Kuo, B., and Ranganathan, C. (2013). “Knowledge contribution in online health communities: an exploratory examination,” in *Proceedings of the Nineteenth Americas Conference on Information Systems*, (Chicago, IL), 15–17.
- Lan, J., Wang, B., Hu, B., and Lei, H. (2020). Impact of psychological contract in knowledge sharing: a case study from industrial cluster enterprises. *E3S Web of Conference* 143:02053. doi: 10.1051/e3sconf/202014302053
- Lee, J., Chiang, F. F. T., van Esch, E., and Cai, Z. (2018). Why and when organizational culture fosters affective commitment among knowledge workers: the mediating role of perceived psychological contract fulfillment and moderating role of organizational tenure. *Int. J. Hum. Res. Manag.* 29, 1178–1207. doi: 10.1080/09585192.2016.1194870
- Levinson, H., Price, C. R., Munden, K. J., Mandl, H. J., and Solley, C. M. (1962). *Men, Management, Mental Health*. Cambridge, MA: Cambridge Harvard University Press. doi: 10.4159/harvard.9780674424746
- Lin, C. A., Atkin, D. J., Cappotto, C., Davis, C., Dean, J., Eisenbaum, J., et al. (2015a). Ethnicity, digital divides and uses of the internet for health information. *Comput. Hum. Behav.* 51, 216–223. doi: 10.1016/j.chb.2015.04.054
- Lin, T., Hsu, J. S., Cheng, H., and Chiu, C. (2015b). Exploring the relationship between receiving and offering online social support: a dual social support model. *Inf. Manag.* 52, 371–383. doi: 10.1016/j.im.2015.01.003
- Liou, D., Chih, W., Yuan, C., and Lin, C. (2016). The study of the antecedents of knowledge sharing behavior. *Internet Res.* 26, 845–868. doi: 10.1108/IntR-10-2014-0256
- Liu, W., He, C., Jiang, Y., Ji, R., and Zhai, X. (2020). Effect of gig workers' psychological contract fulfillment on their task performance in a sharing

- economy-A perspective from the mediation of organizational identification and the moderation of length of service. *Int. J. Environ. Res. Public Health* 17:2208. doi: 10.3390/ijerph17072208
- Lu, V. N., Capezio, A., Restubog, S. L. D., Garcia, P. R. J. M., and Wang, L. (2016). In pursuit of service excellence: investigating the role of psychological contracts and organizational identification of frontline hotel employees. *Tour Manag* 56, 8–19. doi: 10.1016/j.tourman.2016.03.020
- Ma, M., and Agarwal, R. (2007). Through a glass darkly: information technology design, identity verification, and knowledge contribution in online communities. *Inf. Syst. Res.* 18, 42–67. doi: 10.1287/isre.1070.0113
- Macneil, I. R. (1985). Relational contract: what we do and do not know. *Wisconsin Law Rev.* 4, 483–525.
- Masterson, S. S., and Stamper, C. L. (2003). Perceived organizational membership: an aggregate framework representing the employee-organization relationship. *J. Organ. Behav.* 24, 473–490. doi: 10.1002/job.203
- McWilliam, G. (2000). Building stronger brands through online communities. *MIT Sloan Manag. Rev.* 41, 43–54. Available online at: https://www.researchgate.net/publication/239060369_Building_Stronger_Brands_Through_Online_Communities
- Millward, L. J., and Hopkins, L. J. (1998). Psychological contracts, organizational and job commitment. *J. Appl. Soc. Psychol.* 28, 1530–1556. doi: 10.1111/j.1559-1816.1998.tb01689.x
- Mou, J., Shin, D., and Cohen, J. F. (2017). Trust and risk in consumer acceptance of e-services. *Electron Commer. Res.* 17, 255–288. doi: 10.1007/s10660-015-9205-4
- Nahapiet, J., and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Acad. Manage. Rev.* 23, 242–266. doi: 10.5465/amr.1998.533225
- Nambisan, P. (2011). Information seeking and social support in online health communities: impact on patients' perceived empathy. *J. Am. Med. Inform. Assoc.* 18, 298–304. doi: 10.1136/amiajnl-2010-000058
- Pirkkalainen, H., Pawlowski, J. M., Bick, M., and Tannhäuser, A. (2018). Engaging in knowledge exchange: the instrumental psychological ownership in open innovation communities. *Int. J. Inf. Manag.* 38, 277–287. doi: 10.1016/j.ijinfomgt.2017.09.006
- Podsakoff, P. M., MacKenzie, S. B., Lee, J., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879
- Qu, H., and Lee, H. (2011). Travelers' social identification and membership behaviors in online travel community. *Tour Manag.* 32, 1262–1270. doi: 10.1016/j.tourman.2010.12.002
- Raja, U., Johns, G., and Ntalianis, F. (2004). The impact of personality on psychological contracts. *Acad. Manage.* 47, 350–367. doi: 10.5465/20159586
- Ramasamy, M., and Thamaraiselvan, N. (2011). Knowledge sharing and organizational citizenship behavior. *Knowl. Process Manag.* 18, 278–284. doi: 10.1002/kpm.385
- Restubog, S. L. D., Hornsey, M. J., Bordia, P., and Esposito, S. R. (2010). Effects of psychological contract breach on organizational citizenship behavior: insights from the group value model. *J. Manag. Stud.* 45, 1377–1400. doi: 10.1111/j.1467-6486.2008.00792.x
- Riikka, F., and Lämsä, T. (2014). *How to Promote Knowledge Sharing in Organizations Using the Psychological Contract as a Management Tool*. [Master's thesis]. University of Oulu, Oulu, Finland.
- Robinson, S. L., Kraatz, M. S., and Rousseau, D. M. (1994). Changing obligations and the psychological contract: a longitudinal study. *Acad. Manage.* 37, 137–152. doi: 10.5465/256773
- Rodwell, J., Ellershaw, J., and Flower, R. (1971). Fulfill psychological contract promises to manage in-demand employees. *Pers. Rev.* 44, 689–701. doi: 10.1108/PR-12-2013-0224
- Rousseau, D. M. (1990). New hire perceptions of their own and their employer's obligations: a study of psychological contracts. *J. Organ. Behav.* 11, 389–400. doi: 10.1002/job.4030110506
- Rousseau, D. M. (1995). *Psychological Contracts In Organizations: Understanding Written and Unwritten Agreements*. Thousand Oaks, CA: Sage Publications. doi: 10.4135/9781452231594
- Rousseau, D. M., and Tijoriwala, S. A. (1998). Assessing psychological contracts: issues, alternatives and measures. *J. Organ. Behav.* 19, 679–695. doi: 10.1002/(SICI)1099-1379(1998)19:1+<679::AID-JOB971>3.0.CO;2-N
- Shen, J., Zhu, P., and Xu, M. (2018). Knowledge sharing of online health community based on cognitive neuroscience. *Neuroquantology* 16, 476–480. doi: 10.14704/nq.2018.16.5.1351
- Smids, A., van Riel, C. B. M., and Pruyn, A. T. H. (2000). The impact of employee communication and perceived external prestige on organizational identification. *Acad. Manage. J.* 49, 1051–1062. doi: 10.5465/3069448
- Soares, M. E., and Mosquera, P. (2019). Fostering work engagement: the role of the psychological contract. *J. Bus. Res.* 101, 469–476. doi: 10.1016/j.jbusres.2019.01.003
- Stamper, C. L., Masterson, S. S., and Knapp, J. (2009). A typology of organizational membership: understanding different membership relationships through the lens of social exchange. *Manag. Organ. Rev.* 5, 303–328. doi: 10.1111/j.1740-8784.2009.00147.x
- Straub, D., Boudreau, M., and Gefen, D. (2004). Validation guidelines for IS positivist research. *Commun. Assoc. Inf. Syst.* 3, 380–427. doi: 10.17705/1CAIS.01324
- Sun, Y., Wei, K. K., Fan, C., Lu, Y., and Gupta, S. (2016). Does social climate matter? On friendship groups in social commerce. *Electron Commer. Res. Appl.* 18, 37–47. doi: 10.1016/j.elerap.2016.06.002
- Taylor, T., Darcy, S., Hoyer, R., and Cuskelly, G. (2006). Using psychological contract theory to explore issues in effective volunteer management. *Eur. Sport. Manag. Quart* 6, 123–147. doi: 10.1080/16184740600954122
- Tidwell, M. V. (2005). A social identity model of prosocial behaviors within nonprofit organizations. *Nonprofit Manag. Lead* 15, 449–467. doi: 10.1002/nml.82
- Tufan, P., and Wendt, H. (2020). Organizational identification as a mediator for the effects of psychological contract breaches on organizational citizenship behavior: insights from the perspective of ethnic minority employees. *Eur. Manag.* 38, 179–190. doi: 10.1016/j.emj.2019.07.001
- Turnley, W. H., Bolino, M. C., Lester, S. W., and Bloodgood, J. M. (2003). The impact of psychological contract fulfillment on the performance of in-role and organizational citizenship behaviors. *J. Manag.* 29, 187–206. doi: 10.1177/014920630302900204
- Utz, S., and Sassenberg, K. (2002). Distributive justice in common-bond and common-identity groups. *Group Process. Intergr. Relat.* 5, 151–162. doi: 10.1177/1368430202005002542
- van den Hooff, B., Elving, W., Meeuwse, J. M., and Dumoulin, C. (2003). "Knowledge sharing in knowledge communities," in *Communities and Technologies*, Huysman M., Wenger E., Wulf, V., eds. (Dordrecht: Springer), 119–141. doi: 10.1007/978-94-017-0115-0_7
- Wang, W., and Wei, Z. (2011). Knowledge sharing in wiki communities: an empirical study. *Online Inform Rev* 35, 799–820. doi: 10.1108/14684521111176516
- Wasko, M. M., and Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Q.* 29, 35–57. doi: 10.2307/25148667
- Wei, W., Wang, J., Chen, X., Yang, J., and Min, X. (2018). Psychological contract model for knowledge collaboration in virtual community of practice: an analysis based on the game theory. *Appl. Math. Comput* 329, 175–187. doi: 10.1016/j.amc.2018.01.053
- Winzelberg, A. J., Classen, C., Alpers, G. W., Roberts, H., Koopman, C., Adams, R. E., et al. (2003). Evaluation of an internet support group for women with primary breast cancer. *Cancer* 97, 1164–1173. doi: 10.1002/cncr.11174
- Ye, H. J., Feng, Y., and Choi, B. C. F. (2015). Understanding knowledge contribution in online knowledge communities: a model of community support and forum leader support. *Electron. Commer. Res. Appl.* 14, 34–45. doi: 10.1016/j.elerap.2014.11.002
- Yilmaz, R. (2016). Knowledge sharing behaviors in e-learning community: exploring the role of academic self-efficacy and sense of community. *Comput. Hum. Behav.* 63, 373–382. doi: 10.1016/j.chb.2016.05.055
- Yu, T. K., Lu, L. C., and Liu, T. F. (2010). Exploring factors that influence knowledge sharing behavior via weblogs. *Comput. Hum. Behav.* 26, 32–41. doi: 10.1016/j.chb.2009.08.002

- Zagenczyk, T. J., Gibney, R., Few, W. T., and Scott, K. L. (2011). Psychological contacts and organizational identification: the mediating effect of perceived organizational support. *J. Labor. Res.* 32, 254–281. doi: 10.1007/s12122-011-9111-z
- Zhang, X., Liu, S., Deng, Z., and Chen, X. (2017). Knowledge sharing motivations in online health communities: a comparative study of health professionals and normal users. *Comput. Hum. Behav.* 75, 797–810. doi: 10.1016/j.chb.2017.06.028
- Zhang, Y., and Sun, Y. (2015). “Users’ link sharing behaviour in an online health community,” in *ISIC - The Information Behaviour Conference (paper isic35)*. Leeds.
- Zhao, K., John, Y., Greta, G., Qiu, B., Prasenjit, M., and Kenneth, P. (2014). Finding influential users of an online health community: a new metric based on sentiment influence. *J. Am. Med. Inform. Assoc.* 21, 212–218. doi: 10.1136/amiajnl-2013-002282
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Sustaining Continuous Engagement in Value Co-creation Among Individuals in Universities Using Online Platforms: Role of Knowledge Self-Efficacy, Commitment and Perceived Benefits

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Value Co-Creation (VCC) plays a major role in engaging knowledgeable individuals in a community via innovation, problem solving, and new service/product development. This study investigates the personal factors that influence individuals' engagement in value co-creation in Higher Education Institutions (HEIs) through the use of online platforms. Some higher education institutions have successfully established or used appropriate online platforms, such as online forums, web applications, and mobile applications to engage their community in ideation or crowdsourcing as a part of the value co-creation process. On the other hand, some HEIs have failed to engage their community in value co-creation activities, and even if they managed to engage some individuals in value co-creation once, they failed to sustain these individuals' engagement in value co-creation using online platforms. Using the Stimulus Organism Response (S-O-R) framework, this study examines the relationship between relevant personal factors (commitment and knowledge self-efficacy) and other motivational factors that provide perceived benefits with value co-creation engagement. Data was collected from 308 respondents at five Malaysian research universities. The software analysis tool Smart PLS is used for data analysis and validation. The results demonstrate that personal factors and perceived benefits as a motivational factor has a significant effect on individual engagement in value co-creation. However, the significance of these findings varies from one individual to another. The implications of these findings are discussed.

Keywords: value co-creation, community engagement, online platform, commitment, self-efficacy, perceived benefits

INTRODUCTION

Customers are the source and focal element for co-created value (Vargo and Lusch, 2008). Customers' personal, psychological, and competency perspectives have an impact on their level of online engagement in value co-creation. Some authors have emphasized the significant impact of monetary or materialistic reward systems on customer engagement with value co-creation (Füller et al., 2009). On the other hand, other scholars have addressed the specific influential aspects of obtaining benefits that generate various utilitarian, hedonic, or relational outcomes (Nambisan and Baron, 2009). However, these influential aspects might be more suitable for product co-production and co-designing rather than value co-creation in the service sector. Some of the abovementioned influential aspects may still motivate customers in HEIs to engage in value co-creation. While scholars have investigated value co-creation from many different perspectives, studies focusing on co-creation activities from a higher education viewpoint are limited (Sutarso et al., 2019). From the interactional perception, context and personality factors such as reputation, self-development, and altruism explain an individual's motivation to contribute and share knowledge and experience (Oreg and Nov, 2008).

Firms and service organizations should pay more attention to the resources that customers can contribute, explore their potential to engage diverse individuals, and offer opportunities for more extensive value co-creation. Such engagement will facilitate intense individual participation and connection with an organization's offerings or activities. As such, customer participation is viewed as a behavioral component in the interactive sphere. Moreover, customer involvement reflects the cognitive, affective, or motivational component of customer engagement in a service (Jaakkola and Alexander, 2014). On the other hand, the real challenge facing service providers is how to attract and motivate customers to engage in value co-creation processes and how to ensure their continual participation in value co-creation (Monavvarifad et al., 2019).

Previous studies have examined the role of social media, web applications, and online platforms in exploring customer motivations for participating in co-creation activities (Nambisan, 2002; Füller et al., 2009; Nambisan and Baron, 2009; Krishna et al., 2013). These studies have mostly focused on the customers' perceived benefits as the main factor motivating customer online engagement behavior in value co-creation. However, few studies have investigated customer personal factors and their impact on customer online behavior (McElroy et al., 2007; Alan et al., 2017). To this end, the aim of this study is to empirically examine customer-personal factors that lead to value co-creation engagement, considering HEI technological capabilities that guarantee such useful interactions occur. The study extends the concept of influential value co-creation factors by adding two personal factors – participant commitment and knowledge self-efficacy – to the Stimulus Organism Response (S-O-R) framework. The study introduces a comprehensive model that theorizes how the impact of a number of personal variables can lead customers to engage in co-creation activities in HEIs.

Following this introduction, the rest of this article will be organized as follows: Part Two presents a comprehensive review of the literature, Part Three proposes the research model, and Part Four examines this study's implications.

LITERATURE REVIEW AND THEORETICAL BACKGROUND

Co-creation Concept

Kambil et al. (1999) coined the term “co-creation” to refer to the shared creation of value between a company and its customers. In this process, the company proposes co-creation activities that give rise to a new dynamic between the company and the customer, as customers participate in the production process and the distribution of value. Co-creation stresses the integration of company or service provider resources with customers. However, for the concept of value co-creation to be meaningful and manageable, organizations need to know what they should manage. Customers can participate in every stage of the value chain, becoming partial “employees” of the organization (Kambil et al., 1999). Prahalad and Ramaswamy then used “co-creation” to refer to activities in which the consumer and company are both involved in the creation of value (Haro et al., 2014).

Good managers must learn new techniques to motivate customers to co-create value, as well as to find ways to successfully monitor and manage the process of co-creation in their organization.

Value Co-creation in Higher Education Institutions

Innovative individuals in HEIs can be a valuable asset during the development process. The more visibly open providers are to receiving and implementing new ideas, the more opportunities they will receive to be in the front line of giving stakeholders the chance to meet the challenges of the future (Laine et al., 2008). The literature on Higher Education suggests that students can be viewed as “customers” and university lecturers/administrators can be seen as “service providers” (Redding, 2005).

However, other studies have indicated that universities are responding to two different types of clients. These can be classified as internal customers, such as “*students and employees, both academics and technical*,” and external customers, such as “*suppliers, financiers (creditors, NGOs, and funders), trade unions, parents, quality assurance bodies, trade associations, based on education process*” (Pereira and Da Silva, 2003). While many potential customers have long-term relationships with universities, many have also accumulated experience, knowledge, and skills by belonging to HEI professional bodies and standards associations. These resources represent a vital component of co-created value if they are integrated with an HEI's resources. Customers in HEIs are therefore encouraged to introduce innovative and constructive ideas as well as to participate in generating value. Customers in HEIs should increasingly be motivated to express their engagement in value co-creation

to better HEIs using their varying skills, experiences, and competencies (Hasan et al., 2015).

In addition, research on value co-creation engagement in the service sector in general is still at an immature stage, and there is a need for further investigation into how this engagement can be sustained through an effective technology platform, especially amongst HEIs (Fadeeva and Mochizuki, 2010; Waas et al., 2010; Monavvarifad et al., 2019). While customer participation in the service sector is not novel, what is new is the acknowledgment that HEIs only provide partial input into a customer's experience (McColl-Kennedy et al., 2009). It is therefore necessary to co-opt and empower HEI customers to take a role in value co-creation in the education sector (Vargo and Lusch, 2008). Co-creation through HEIs is a vital activity that enables sustainable development, social innovation, and community transformation, thus driving HEIs to become world leaders in developing successful international partnerships with businesses and communities (Laine et al., 2008; Kumari et al., 2020).

Related Theoretical Work

Prior studies on value co-creation have examined the determinants of customer participation, with a focus on the new product development stage (Füller et al., 2009; Hoyer et al., 2010) and the product support stage (Nambisan and Nambisan, 2008; Nambisan and Baron, 2009). For instance, Füller et al. (2009) investigated the determinants of consumer intentions to participate in co-creation activities during new product development from a consumer empowerment perspective. In another study, Füller (2006) examined six motivational factors that impact customer engagement in value co-creation through virtual development activities in the online community, which were monetary rewards, showing ideas, gaining knowledge, intrinsic interest, dissatisfaction, and curiosity. Hoyer et al. (2010) presented a conceptual framework that examined the experiences and consequences of co-creation throughout new product development processes with respect to consumer co-creation. Meanwhile, Nambisan and Baron (2009) examined the experiences of customer participation in product support from an integrative perspective that incorporated interaction-based customer benefits and affective evaluation using the Use and Gratification (U and G) framework (Katz and Blumler, 1974). The U and G framework identifies four comprehensive benefit types: cognitive benefits, social integrative benefits, personal integrative benefits, and hedonic benefits that individuals can derive from media usage. A number of relevant studies have examined why customers participate in co-creation activities on firm-initiated online platform sites. They have found that customer participation in value co-creation was determined by customer learning values, social integrative values, and hedonic experiences, which were influenced by perceived task-relevant and affection-relevant causes (Zhang et al., 2015; Roy et al., 2019).

S-O-R Framework

The current study's research model was developed based on the S-O-R framework (Mehrabian and Russell, 1974).

This outlines how different Stimuli (S) influence individual internal Organisms (O) to derive behavioral Responses (R). S-O-R theory has been used in many studies to investigate the factors that influence customer behaviors toward value co-creation in online contexts. These behaviors include participation, intention for future participation, and engagement in VCC activities through online platforms (Chuang and Lin, 2014; Chuang and Chen, 2015; Zhang et al., 2015; Zhang and Benyoucef, 2016).

This study uses the S-O-R framework as a theoretical base for two reasons. First, the S-O-R framework has been used in previous studies on online customer behavior, and their findings have affirmed that S-O-R is an appropriate framework for explaining customer reactions and behavioral responses to the different types of stimuli. Second, by investigating the roles of certain personal factors and perceived benefits in influencing value co-creation engagement behaviors using online platforms, the S-O-R framework provides an acceptable structured approach for examining the effects of personal factors (stimuli) on customer's internal reactions to perceived benefits (internal organisms) and their engagement in co-creation activities (external response).

RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

Individual Commitment in HEIs Communities and Perceived Benefits

The term "commitment" has been defined as an individual's pride in belonging, their concern for long-term success, and a desire as a customer to contribute toward the betterment of an organization (Morgan and Hunt, 1994). Previous empirical studies conducted in online settings has shown that individuals engage in value co-creation activities and share knowledge because they expect to obtain learning benefits, such as enhanced knowledge (Greve et al., 2016). Commitment can be the result of a cognitive calculation or an emotional attachment (Geyskens et al., 1996; Wetzels et al., 1998). This study therefore considers HEIs to be part of the service sector, which makes affective commitment underlie loyalty decisions since commitment is founded upon cognitive calculation. Based on the literature review, this study created the following hypothesis:

H1a: Commitment is positively associated with learning benefits in the context of value co-creation engagement in HEIs.

In addition, an individual's willingness to share their own ideas and knowledge via online co-creation platforms is motivated by intangible rewards such as improved reputation, image, or status (Jahani et al., 2013; Šajeva, 2014). However, some research has found that reputation did not have a significant impact on knowledge sharing in the academic environment (Mallasi and Ainin, 2015). In this study, we modified a definition of reputation used in previous studies to fit our study context, as

there is a perception that reputation increases when knowledge is contributed during value co-creation on online platforms (Kankanhalli et al., 2005). This study thus proposes the following hypothesis:

H1b: Commitment is positively associated with reputation improvements in the context of value co-creation engagement in HEIs.

“Intrinsic benefits” are obtained when individuals derive enjoyment and pleasure from helping others without expecting something in return (Krebs, 1975; Ryan and Deci, 2000). Prior studies on online platforms have found that knowledge contributors gain satisfaction from pursuing altruistic behavior and are willing to engage in intellectual exposure and problem-solving to contribute knowledge because they are intrinsically motivated to face challenges, to pursue satisfaction, or enjoy helping others (Wasko and Faraj, 2000, 2005). As an individual's willingness to share knowledge has been proven to have a significant relationship with intrinsic benefits in the context of knowledge sharing, it is assumed that the same significant relationship will exist in the context of value co-creation online engagement. Therefore:

H1c: Commitment is positively associated with intrinsic benefits in the context of value co-creation engagement in HEIs.

Some researchers have defined extrinsic rewards as benefits, payments, or career prospects that are given in return for the participation of some individuals in value co-creation (Füller, 2010). The term “extrinsic benefits” denotes the tangible benefits offered by organizations to individuals or employees (Newman and Sheikh, 2012). Organizations can offer different forms of financial rewards to motivate individuals to share knowledge and add value to their organization, such as an increase in salary, job security, bonuses, or promotions (Kankanhalli et al., 2005; He and Wei, 2009). It is therefore expected that individuals who are satisfied with their extrinsic benefits will have a greater affective commitment toward the organization in return (Newman and Sheikh, 2012). Therefore:

H1d: Commitment is positively associated with extrinsic benefits in the context of value co-creation engagement in HEIs.

The Effect of Knowledge Self-Efficacy on Perceived Benefits

A belief in self-efficacy is necessary for an individual to be considered a value co-creator or co-producer (Jacob and Rettinger, 2011). In contrast, when a person believes that they are incapable of performing a particular task, they will not engage in that behavior, even if they acknowledge that it is a better alternative (Meuter et al., 2005). Knowledge self-efficacy typically manifests when a person believes that their knowledge can help solve job-related problems (Constant et al., 1996) or make a difference in their organization (Wasko and Faraj, 2000). Knowledge self-efficacy is the confidence in one's ability to provide knowledge that is valuable to an organization via online platforms (Constant et al., 1996;

Kalman, 1999; Kankanhalli et al., 2005). Knowledge self-efficacy plays an important role in acquiring the desired knowledge, making it an important factor when determining the effectiveness of a new learning strategy (Kuznar, 2009). Therefore:

H2a: Knowledge self-efficacy is positively associated with learning benefits in the context of value co-creation engagement in HEIs.

Social benefits such as status, image, and respect cause behaviors to increase in intensity (Hoisl et al., 2007). Previous investigations into methods of triggering creativity and ideas found that social benefits such as reputation and image positively affected an individual's self-esteem, which is part of self-efficacy (Hung et al., 2011). Additionally, other scholars have suggested that individuals who share their experience and knowledge with others will gain benefits such as enhanced self-image, reputation, and status in their social circle (Wasko and Faraj, 2005; Hsu et al., 2007). Therefore:

H2b: Knowledge self-efficacy is positively associated with image benefits in the context of value co-creation engagement in HEIs.

Previous studies on knowledge contributions to electronic repositories found that knowledge self-efficacy and enjoyment in helping others were intrinsic benefits that had significant and positive relationships with using online platforms to share knowledge (Kankanhalli et al., 2005). To find the relationship between Knowledge Self-Efficacy and enjoyment in helping others as an intrinsic benefit, this study thus proposes:

H2c: Knowledge self-efficacy is positively associated with intrinsic benefits in the context of value co-creation engagement in HEIs.

Scholars studying behavioral intention formation in knowledge sharing have argued that extrinsic rewards do not represent a primary motivator within knowledge-sharing initiatives. However, there is a consensus on the importance of enhancing individual self-efficacy to engage individuals in knowledge-sharing behaviors (Bock et al., 2005). To examine the relationship between Knowledge Self-Efficacy and extrinsic benefits, this study therefore proposes:

H2d: Knowledge Self-Efficacy is positively associated with extrinsic benefits in the context of value co-creation engagement in HEIs.

The Effect of Learning Benefits

In the process of co-creating value through online platforms, some customers are motivated by gaining learning benefits and acquiring knowledge about a technology-based product or developing new services (Nambisan and Baron, 2009). Etgar (2008) highlights the importance of considering the motivations of the customer to participate in co-creation (Etgar, 2008). Similarly, Payne et al. (2008) emphasized that customer learning is one of the central parts of co-creation (Payne et al., 2008). Etgar (2008) points out that customer learning is a source of motivation to participate in co-creation. Moreover, customers might decide

to participate because they enjoy the process (Etgar, 2008). Based on the literature, we hypothesize:

H3: Learning benefits will have a positive influence on value co-creation engagement by HEI communities.

The Effect of Social Benefits (Image)

Some participants in value co-creation may receive social benefits, such as titles or other forms of recognition, that a firm might bestow on particularly valuable contributors. The social benefits of co-creation include increased status, social esteem, “good citizenship,” and the strengthening of ties with other relevant actors (Nambisan and Baron, 2009). When organizations apply value co-creation activities, such as the generation of ideas through crowdsourcing, it is also important to highlight that the reward is always given by the initiator of the crowdsourcing initiative (provider). While there can be a secondary reward, such as social recognition from other crowdsourcing participants, these rewards are not the focus and do not need to be presented. It can therefore be concluded that the user will obtain satisfaction of a given necessity, whether it be economic, social recognition, self-esteem, or the development of individual skills (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). Based on the literature, this study proposes the following hypothesis:

H4: Social benefits will have a positive influence on value co-creation engagement by HEI communities.

Intrinsic Benefits

Past studies on motivations for value co-creation in the context of open innovation projects have shown that there are multiple reasons that customers engage in value co-creation activities. Some of these are purely intrinsic motives, such as fun, kinship, and altruism (Füller, 2010). By co-creating value, contributors feel satisfied because they gain a strong feeling of achievement. The sense of creating something or contributing to something important to your peers or society has a bigger impact than just deriving value from the provider (Krishna et al., 2013). There are thus some participants in value co-creation who are influenced by intrinsic motivations (San Cornelio and Gomez Cruz, 2014), personal drives as altruism or self-reward, or the pleasure of taking part in an activity (Janzik and Herstatt, 2008). It is interesting to note that a number of previous studies have suggested that intrinsic benefits cause value co-creators to become involved in development activities (i.e., attitudes, intentions, and participation) (Maurer et al., 2003). Based on the literature, this study proposes the following hypothesis:

H5: Intrinsic Benefits will have a positive influence on value co-creation engagement by HEI communities.

Extrinsic Benefits

Some researchers have defined purely extrinsic rewards or benefits as the granting of payments or career prospects in return for the participation of individuals in value co-creation (Füller, 2010). Some individuals who participate in value co-creation are “motivated by financial rewards, either in a direct way in the form

of financial prizes or revenues sharing from the firm that engages in co-creation activates, or indirectly, through the intellectual property that they might receive, or through the recognition that they might receive from being engaged in co-creation competitions” (Hoyer et al., 2010). Nevertheless, many others are not purely motivated by money: they choose to “free reveal” ideas and freely share effort in the post-ideation stages of co-creation (Franke et al., 2005). Based on the literature, this study proposes the following hypothesis:

H6: Extrinsic Benefits will have a positive influence on value co-creation engagement by HEIs.

Mediation Effect

The mediation effect occurs when a third variable (the mediator variable) intervenes in the relationship between the independent and dependent variables (Preacher and Hayes, 2008). Mediation is also known as the “indirect effect,” which requires theoretical or conceptual support to explore meaningful mediation effects (Hayes and Preacher, 2011; Hair et al., 2016), as the main objective in mediation analysis is explaining how a given effect occurs (Henseler et al., 2016). According to Ramayah et al. (2018), when support exists for the mediating relationship, mediation can be a useful tool for statistical analysis. This study thus expects to have multiple mediation effects, as follows:

H7: The effect of Commitment on Engagement will be mediated by Learning Benefits

H8: The effect of Knowledge self-efficacy on Engagement will be mediated by Learning Benefits

H9: The effect of Commitment on Engagement will be mediated by Image

H10: The effect of Knowledge self-efficacy on Engagement will be mediated by Image

H11: The effect of Commitment on Engagement will be mediated by Intrinsic Benefits

H12: The effect of Knowledge self-efficacy on Engagement will be mediated by Intrinsic Benefits

H13: The effect of Commitment on Engagement will be mediated by Extrinsic Benefits

H14: The effect of Knowledge self-efficacy on Engagement will be mediated by Extrinsic Benefits.

RESEARCH METHODOLOGY AND DATA COLLECTION

The model used in this study is complex, with two independent variables, four mediators, and one multi-dimensional dependent variable. This study therefore used Partial Least Square-Structural Equation Modeling (PLS-SEM) using SmartPLS v. 3.2.8 (Ringle et al., 2015) as a statistical tool to examine the measurement and structural model. This approach is particularly suited to

this paper as it can accommodate smaller sample sizes without normality assumptions, which is required as survey research is not normally distributed (Chin et al., 2003). This study followed the guidelines of Anderson and Gerbing (1988) and tested the measurement model using a two-step approach, which was followed by the assessment of the structural model (Anderson and Gerbing, 1988).

The two personal independent variables comprised a knowledge self-efficacy factor represented by items adopted from Kankanhalli et al. (2005), and a commitment factor with four items adopted from Bozeman and Perrewé (2001). The four perceived benefit variables included 15 items: (four items for learning benefits, five items for social benefits (image), three items for intrinsic benefits, and four items for extrinsic benefits). The response scale used a 5-point Likert scale with 1 = strongly disagree to 5 = strongly agree. For the dependent variable (value co-creation engagement), which is a multi-dimensional construct, the “represented in web engagement” variable with four items was adopted from Webster and Ahuja (2006) while the “interactional engagement” variable with four items was adopted from So et al. (2014). The items for all of these constructs listed as **Supplementary Materials** attached with this research paper see **Supplementary Table 6**.

The population of this study included students and staff from five public research universities in Malaysia. These five public research universities were chosen because they had already implemented value co-creation activities utilizing specific online platforms. Moreover, potential respondents should have experience with using university online platforms to participate in value co-creation related activities.

According to Anderson and Gerbing (1984), the minimum sample size to make appropriate estimates is 100–150 subjects. However, other authors recommend a minimum sample size of 200 respondents (Hoelter, 1983). To ensure the adequacy of the sample size, G*power3 software was therefore used (Faul et al., 2007). The setting proposed by Dattalo (2008) was used ($\alpha = 0.05$, $\beta = 0.8$, and effect size $f^2 = 0.15$). **Supplementary Figure 2** shows that at error probability of 0.05, and confidence level 80%, the minimum required sample size for this study is 98. This result indicates that the sample of 308 collected surveys used in this study is adequate.

The survey was conducted using self-administered questionnaires that were distributed to the target group, members of which were selected using a purposive sampling technique. The survey for this study was carefully designed and validated in several stages, including face validity, content validity, and validity pretests. Both online and printed questionnaires were distributed to targeted universities, and after incomplete and unreturned questionnaires were excluded, only 308 questionnaires were valid for analysis. The respondent profile was determined using the frequencies and percentages shown in **Supplementary Table 1**. The majority of participants were female (68%), while 32% were male. The respondents were relatively young, being mainly 20 to 35 years old (67%), while 33% were older. **Supplementary Table 1** summarizes the respondent's demographic information.

RESULTS

Measurement Model Assessment

To assess the measurement items and constructs, this study tested both convergent and discriminant validity. The tests for reliability and convergent validity are presented in **Supplementary Table 2**. This study used composite reliability to assess reliability and values more than 0.7, which is considered sufficient (Hair et al., 2016; Memon et al., 2017). Convergent validity, which assesses the degree to which items are related to the construct as theoretically conceptualized, were checked using the item loadings and Average Variance Extracted (AVE) for each construct (Hair et al., 2016; Memon et al., 2017). All item loadings exceeded 0.7, and for AVE all constructs exceeded the threshold value of 0.50 (Fornell and Larcker, 1981), indicating adequate convergent validity in the measurement model. VCC Engagement is a second-order factor with two lower-order dimensions (IEG and WEG) that had a loading of 0.818 and 0.900, an AVE of 0.818, and a Composite reliability of 0.900, which also passes the convergent validity test.

The term “discriminant validity” refers to the degree to which constructs hold discrimination to each other. This study tested discriminant validity using the heterotrait-monotrait ratio of correlations (Henseler et al., 2015), as shown in **Supplementary Table 3**. If a HTMT value is greater than 0.85 (Kline, 2015), then there is a discriminant validity problem, whereas a value smaller than 0.85 signals discriminant validity is good. As all HTMT values were less than 0.85 (Kline, 2015), as shown in **Supplementary Table 3**, good discriminant validity was ascertained. Both assessments show that the measurement items were valid and reliable, thus allowing for hypothesis testing.

Structural Model Assessment

This study tested the structural model by assessing the explained variance (R^2), path coefficients, and corresponding t -values. This study used a bootstrapping procedure with 5,000 resamples (Hair et al., 2016; Memon et al., 2017) to derive a valid standard error for t -value calculation. This study first analyzed the effect of personal factors on perceived benefits, followed by the effect of perceived benefits on VCC engagement and indirect effects. Commitment and knowledge self-efficacy together explained 17.8% (Extrinsic Benefits), 37.4% (Social Benefits), 44.7% (Intrinsic Benefits), and 43.1% (Learning Benefits) of variance in VCC Engagement. All four perceived benefits explained 50.6% of the variance in VCC Engagement.

For the direct relationships (see **Supplementary Table 4**), the study's first (H1a,b,c,d) hypothesis states the commitment has a positive relationship with Extrinsic Benefits, Image, Intrinsic Benefits, and Learning Benefits. The results indicate path coefficients are 0.317, 0.104, 0.355, and 0.044, with t values of 4.989, 1.648, 5.416, and 0.886 for one tailed test. This indicates that hypotheses Ha,b, and c are accepted while hypothesis Hd is rejected.

Hypothesis H2 indicates that knowledge self-efficacy has a positive relationship with Extrinsic Benefits, Image, Intrinsic

Benefits, and Learning Benefits. The results indicate path coefficients are 0.405, 0.559, 0.382, 0.393 with t values of 7.153, 8.433, 5.773, and 4.872 for one tailed test. The results indicate that knowledge self-efficacy has a positive relationship with Extrinsic Benefits, Image, Intrinsic Benefits, and Learning Benefits. Similarly, hypotheses H3, H4, H5, and H6 indicate that Extrinsic Benefits, Image, Intrinsic Benefits, and Learning Benefits have a positive relationship with engagement. The results indicate that the path coefficients are 0.131, 0.145, 0.140, and 0.138, respectively, with t values of 3.505, 3.658, 4.479, and 2.849. This indicates a significant positive relationship. Hypotheses H3, H4, H5, and H6 are thus accepted.

For testing the mediation effect in PLS-SEM, the application of bootstrapping has been recognized by researchers as the more rigorous and powerful application available for inference statistics (Hayes, 2009; Henseler et al., 2009; Zhao et al., 2010; Hair et al., 2013). In the present research, the bootstrapping technique was used with 500 sub-samples to generate approximate t -values for significance testing of all the path coefficients. **Supplementary Table 5** below presents the t -statistics values.

Hypotheses H7, H9, and H11 to H13 state the indirect effect of commitment on engagement through Extrinsic Benefits, Image, Intrinsic Benefits, and Learning Benefits. The path coefficients of indirect paths were reported to be 0.078, 0.023, 0.097, and 0.006, respectively, with t values of 2.673, 0.175, 3.234, and 0.572. This indicates hypotheses H7 and H11 were accepted and hypotheses H9 and H13 were rejected. Similarly, Hypotheses H8, H10, and H12 to H14 refer to the indirect effect of self-efficacy on engagement through Extrinsic Benefits, Image, Intrinsic Benefits, and Learning Benefits. The path coefficients of indirect paths were reported to be 0.100, 0.122, 0.105, and 0.056, respectively, with t values of 2.942, 3.022, 3.450, and 2.042. This indicates hypotheses H8, H10, H12, and H14 were accepted. **Supplementary Table 5** shows the results of indirect effects.

DISCUSSION AND IMPLICATIONS

Discussion

After examining the validity and reliability of the constructs, this study tested the proposed hypotheses using Smart PLS. The results demonstrated that all direct relationships between the two personal factors (individual commitment and knowledge self-efficacy) had a significant effect on all four perceived benefits, as H1a, H2a, H1b, H2b, H1c, H2c, H2d, H3, H4, H5, and H6 were supported while H1d was not supported. Hypothesis H1d tested the relationship between individual commitment and extrinsic benefits, and it not being supported shows that individual commitment to participate in value co-creation activities was not significantly influenced by extrinsic benefits.

Extrinsic benefits in the context of this study were defined as an individuals' belief that monetary or tangible incentives will be given in return for ideas and knowledge-sharing as part of value co-creation activities. The results of this

study appear to reject the hypothesis that an individual's commitment has a positive relation with extrinsic benefits when engaging in value co-creation. This is inconsistent with the findings of other researchers who found a significant relationship between extrinsic rewards and individual attitudes toward knowledge-sharing (O'Reilly and Pondy, 1979; Quinn et al., 1998; Liebowitz, 2002). This inconsistency might have arisen for several reasons. First, the context of this study is academic, and for academic staff and students, monetary and tangible rewards may not significantly contribute to the formation of commitments to share knowledge and experience in value co-creation activities (Welschen, 2014).

Participants in value co-creation at universities may therefore place greater value on intangible rewards and benefits than tangible benefits (Gustad, 1960). Moreover, this study was conducted in 5 public research Universities in Malaysia, where the participants were predominantly Muslims. It should therefore be taken into account that some participants might consider experience-sharing for value creation to be encouraged according to Islamic beliefs and teaching as a spiritually rewarded behavior regardless of any tangible rewards offered in return (Jolaei et al., 2014). Participants may thus share their knowledge and experience without consideration for monetary rewards. The results of this study therefore confirm that there is a significant relationship between individual commitment and knowledge self-efficacy with the perceived benefits from engaging participants in HEIs in online value co-creation activities. The results of this study demonstrate a significant relationship between perceived benefits and value co-creation engagement, as shown in **Supplementary Table 3**.

On the other hand, as illustrated in **Supplementary Table 5**, the results show that six out of eight indirect relationships were significant (H7, H8, H10, H11, H12, and H14) while the other two indirect relationships (H9 and H13) were insignificant. It is thus found that an individual's knowledge self-efficacy has a significant indirect relationship on an individual's engagement in value co-creation through all of the four perceived benefits. This result is consistent with the previous value co-creation literature that emphasized the importance of a participant's confidence, along with their ability to provide knowledge that is valuable to the organization via online platforms (Constant et al., 1996; Kalman, 1999; Kankanhalli et al., 2005). According to Vargo and Lusch (2004), knowledge and skills are the most important types of resource that enable co-creation of value to occur according to the service-dominant logic (S-D) concept (Vargo and Lusch, 2004; Campbell et al., 2013).

In addition, individual commitment has a significant and indirect relationship on individual engagement in value co-creation through learning benefits and intrinsic benefits. This is consistent with the value co-creation literature in that a participant's sense of commitment positively influences customer engagement in value co-creation activities through online HEI platforms (Brodie et al., 2013; Bugshan, 2015). A sense of commitment thus strongly motivates staff and students in universities to contribute ideas and engage in value co-creation activities through online university platforms.

Only two relationships, H9 and H13, were found to be insignificant as to extrinsic benefits and image representing social benefits. These findings are logically and analytically acceptable for an indirect relationship, because they almost reflect the significance of the direct relationship seen in **Supplementary Table 3** in relation to the commitment and extrinsic benefits. Regarding the relationship between commitment, image, and engagement, the $COM \rightarrow IMG \rightarrow Engagement$ results revealed an insignificant relation. This might be because participants dealt with image and reputation benefits in the same way they evaluated and dealt with extrinsic benefits.

Theoretical and Practical Implications

This study contributes to the value co-creation literature by demonstrating that personal factors (individual's commitment, knowledge self-efficacy, and perceived benefits) have a great influence on customer engagement in value co-creation in higher education institutions through the use of online platforms. This result contributes to the value co-creation literature on the importance of the relationship between personal factors and value co-creation engagement. In addition, the study also demonstrated that knowledge self-efficacy and commitment plays a significant role in individual online engagement in value co-creation activities. High levels of commitment, knowledge self-efficacy and perceived benefits lead to high levels of engagement with online value co-creation activities.

The study also has some practical implications. First, although previous studies found that perceived benefits motivate potential participation in value co-creation (McElroy et al., 2007; Alan et al., 2017), the findings of this study imply that HEIs should pay more attention to fostering and engaging individuals with knowledge self-efficacy and commitment as they are very significant stimuli for engaging in value co-creation. This can be implemented *via* workshop training, seminars, and gatherings within the HEI community designed to encourage individuals to practice affective commitment and gain knowledge self-efficacy through continual participation in value co-creation activities.

Second, to maximize and maintain high levels of value co-creation engagement behavior among HEI communities using online platforms, great consideration should be given to both how attractive a platform is and also how organizations can maximize perceived benefits and encourage individuals to have high commitment and self-efficacy.

Directions for Further Studies

While this study contributes to the literature in both theory and practice, it still has a number of limitations that need to be considered. This study was conducted in a Malaysian context, meaning cultural and environmental differences must be considered when generalizing its findings. Moreover, survey data was collected from only five public universities. Further research could expand the survey to cover students from different public and private universities.

The units of analysis in this study included only a limited number of HEI internal customers as targeted respondents,

such as students, academic staff, non-academic staff, and administrators. However, external stakeholders, which might include parents, related government agencies, industries, NGOs and other associated educational entities, were not included as target respondents in this study. Since this study mainly introduced personal factors that cause HEIs communities to engage in value co-creation through the use of online platforms, future studies might include other relevant elements such as online platform characteristics or other personal and organizational factors.

CONCLUSION

This study suggests a theoretical model of the influence of personal factors mediated by four variables of perceived benefits on value co-creation engagement behavior in the HEI service sector. Moreover, this study explored and incorporated significant variables (commitment, knowledge self-efficacy, and perceived benefits) using the S-O-R framework to test how these variables cause individuals in the HEI community to engage in value co-creation activities. The results revealed that commitment, knowledge self-efficacy, and the mediative impact of perceived benefits had a positive effect on continuous customer engagement in value co-creation in higher education institutions with online platforms.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

NA-K and TR provided data collection and initial analysis. NG, MS, and AA worked on the results, conceptualization, and methodology. AA, MS, and NA-K provided writing, review, and editing. All authors contributed to this study, read, and agreed to the published version of the manuscript.

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SUPPLEMENTARY MATERIAL

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REFERENCES

- Alan, A. K., Kabadayı, E. T., Bakis, S., and Ildokuz, S. I. (2017). The role of individual factors on online shopping behavior. *J. Bus. Econ. Finance* 6, 200–215. doi: 10.17261/pressacademia.2017.680
- Anderson, J. C., and Gerbing, D. W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika* 49, 155–173. doi: 10.1007/bf02294170
- Anderson, J. C., and Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychol. Bull.* 103, 411–423. doi: 10.1037/0033-2909.103.3.411
- Bock, G.-W., Zmud, R. W., Kim, Y.-G., and Lee, J.-N. (2005). Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological factors, and organizational climate. *MIS Q.* 29, 87–111. doi: 10.2307/25148669
- Bozeman, D. P., and Perrewé, P. L. (2001). The effect of item content overlap on organizational commitment questionnaire–turnover cognitions relationships. *J. Appl. Psychol.* 86, 161–173. doi: 10.1037/0021-9010.86.1.161
- Brodie, R. J., Ilic, A., Juric, B., and Hollebeek, L. (2013). Consumer engagement in a virtual brand community: an exploratory analysis. *J. Bus. Res.* 66, 105–114. doi: 10.1016/j.jbusres.2011.07.029
- Bugshan, H. (2015). Co-innovation: the role of online communities. *J. Strateg. Mark.* 23, 175–186. doi: 10.1080/0965254x.2014.920905
- Campbell, N., O'Driscoll, A., and Saren, M. (2013). Reconceptualizing resources: a critique of service-dominant logic. *J. Macromarketing* 33, 306–321. doi: 10.1177/0276146713497755
- Chin, W. W., Marcolin, B. L., and Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: results from a monte carlo simulation study and an electronic-mail emotion/adoption study. *Inf. Syst. Res.* 14, 189–217. doi: 10.1287/isre.14.2.189.16018
- Chuang, H.-M., and Chen, Y.-S. (2015). Identifying the value co-creation behavior of virtual customer environments using a hybrid expert-based DANP model in the bicycle industry. *Hum. Centric Comput. Inf. Sci.* 5:11.
- Chuang, H.-M., and Lin, C.-K. (2014). Exploring learners' value co-creation behavior in e-learning environments. *Dev. Distance Learn. Taiwan High. Educ.* 1, 195–215.
- Constant, D., Sproull, L., and Kiesler, S. (1996). The kindness of strangers: the usefulness of electronic weak ties for technical advice. *Organ. Sci.* 7, 119–135. doi: 10.1287/orsc.7.2.119
- Dattalo, P. (2008). *Determining Sample Size: Balancing Power, Precision, and Practicality*. Oxford university press.
- Estellés-Arolas, E., and González-Ladrón-de-Guevara, F. (2012). Towards an integrated crowdsourcing definition. *J. Inf. Sci.* 38, 189–200. doi: 10.1177/0165551512437638
- Etgar, M. (2008). A descriptive model of the consumer co-production process. *J. Acad. Mark. Sci.* 36, 97–108. doi: 10.1007/s11747-007-0061-1
- Fadeeva, Z., and Mochizuki, Y. (2010). Higher education for today and tomorrow: university appraisal for diversity, innovation and change towards sustainable development. *Sustain. Sci.* 5, 249–256. doi: 10.1007/s11625-010-0106-0
- Faul, F., Erdfelder, E., Lang, A.-G., and Buchner, A. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav. Res. Methods* 39, 175–191. doi: 10.3758/BF03193146
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312
- Franke, N., von Hippel, E., and Schreier, M. (2005). *Finding Commercially Attractive User Innovations: A Test of Lead User Theory*. Cambridge, MA: Massachusetts Institute of Technology (MIT).
- Füller, J. (2006). Why consumers engage in virtual new product developments initiated by producers. *Adv. Consum. Res.* 33, 639–646.
- Füller, J. (2010). Refining virtual Co-creation from a consumer perspective. *Calif. Manage. Rev.* 52, 98–122. doi: 10.1525/cmr.2010.52.2.98
- Füller, J., Mühlbacher, H., Matzler, K., and Jawecki, G. (2009). Consumer empowerment through internet-based co-creation. *J. Manage. Inf. Syst.* 26, 71–102. doi: 10.2753/MIS0742-1222260303
- Geyskens, I., Steenkamp, J.-B. E. M., Scheer, L. K., and Kumar, N. (1996). The effects of trust and interdependence on relationship commitment: a transatlantic study. *Int. J. Res. Mark.* 13, 303–317. doi: 10.1016/S0167-8116(96)00066-7
- Greve, K., Martinez, V., Jonas, J., Neely, A., and Möslin, K. (2016). “Facilitating co-creation in living labs: the JOSEPHS study,” in *Proceedings of the 23rd EurOMA Conference* (Trondheim).
- Gustad, J. W. (1960). *The Career Decisions of College Teachers: A Report of Research in the Southern Region*. Atlanta: Southern Regional Education Board.
- Hair, J. F. Jr., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2016). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks, CA: Sage publications.
- Hair, J. F., Ringle, C. M., and Sarstedt, M. (2013). Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance. *Long Range Plann.* 46, 1–12. doi: 10.1016/j.lrp.2013.01.001
- Haro, M. A. G., Ruiz, M. P. M., and Cañas, R. M. (2014). The effects of the value co-creation process on the consumer and the company. *Exp. J. Mark.* 2, 68–81.
- Hasan, N., Rahman, A. A., and Saeed, F. (2015). Motivations for value co-creation in higher education institutions using online platforms: case of idea bank. *J. Teknol.* 73, 61–66.
- Hayes, A. F. (2009). Beyond baron and kenny: statistical mediation analysis in the new millennium. *Commun. Monogr.* 76, 408–420. doi: 10.1080/03637750903310360
- Hayes, A. F., and Preacher, K. J. J. M. s. f. p. (2011). Indirect and direct effects of a multicategorical causal agent in statistical mediation analysis. 6.
- He, W., and Wei, K.-K. (2009). What drives continued knowledge sharing? An investigation of knowledge-contribution and-seeking beliefs. *Decis. Support Syst.* 46, 826–838. doi: 10.1016/j.dss.2008.11.007
- Henseler, J., Hubona, G., and Ray Pauline, A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Indust. Manage. Data Syst.* 116, 2–20. doi: 10.1108/IMDS-09-2015-382
- Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* 43, 115–135. doi: 10.1007/s11747-014-0403-8
- Henseler, J., Ringle Christian, M., and Sinkovics Rudolf, R. (2009). “The use of partial least squares path modeling in international marketing,” in *New Challenges to International Marketing*, eds R. S. Rudolf and N. G. Pervez (Bingley: Emerald Group Publishing Limited), 277–319. doi: 10.1108/s1474-7979(2009)0000020014
- Hoelter, J. W. (1983). The analysis of covariance structures: goodness-of-fit indices. *Sociol. Methods Res.* 11, 325–344. doi: 10.1177/0049124183011003003
- Hoisl, B., Aigner, W., and Miksch, S. (2007). “Social rewarding in wiki systems–motivating the community,” in *Proceedings of the International Conference on Online Communities and Social Computing* (Berlin: Springer), 362–371. doi: 10.1007/978-3-540-73257-0_40
- Hoyer, W. D., Chandy, R., Dorotic, M., Krafft, M., and Singh, S. S. (2010). Consumer cocreation in new product development. *J. Serv. Res.* 13, 283–296. doi: 10.1177/1094670510375604
- Hsu, M.-H., Ju, T. L., Yen, C.-H., and Chang, C.-M. (2007). Knowledge sharing behavior in virtual communities: the relationship between trust, self-efficacy, and outcome expectations. *Int. J. Hum. Comput. Stud.* 65, 153–169. doi: 10.1016/j.ijhcs.2006.09.003
- Hung, S.-Y., Durcikova, A., Lai, H.-M., and Lin, W.-M. (2011). The influence of intrinsic and extrinsic motivation on individuals' knowledge sharing behavior. *Int. J. Hum. Comput. Stud.* 69, 415–427. doi: 10.1016/j.ijhcs.2011.02.004
- Jaakkola, E., and Alexander, M. (2014). The role of customer engagement behavior in value co-creation: a service system perspective. *J. Serv. Res.* 17, 247–261. doi: 10.1177/1094670514529187
- Jacob, F., and Rettinger, B. (2011). *The Role of Customer Co-Production in Value Creation*. Available online at: <https://www.semanticscholar.org/paper/The-Role-of-customer-co-production-in-value-Jacob/3d5170f2b9a4bd1633a59d6cebfa0a29dd8bc647c>
- Jahani, S., Effendi, A., and Ramayah, T. (2013). Reward system and knowledge sharing behavior among Iranian academics: preliminary survey findings. *Int. Bus. Innov.* 1, 37–51.

- Janzik, L., and Herstatt, C. (2008). *Innovation Communities: Motivation and Incentives for Community Members to Contribute*. New Jersey, NY: IEEE, 350–355.
- Jolaei, A., Md Nor, K., Khani, N., and Md Yusoff, R. (2014). Factors affecting knowledge sharing intention among academic staff. *Int. J. Educ. Manag.* 28, 413–431. doi: 10.1108/ijem-03-2013-0041
- Kalman, M. E. (1999). *The Effects of Organizational Commitment and Expected Outcomes on the Motivation to Share Discretionary Information in a Collaborative Database: Communication Dilemmas and other Serious Games*. California: University of Southern California.
- Kambil, A., Friesen, G. B., and Sundaram, A. (1999). Co-creation: a new source of value. *Outlook Mag.* 3, 23–29.
- Kankanhalli, A., Tan, B. C., and Wei, K.-K. (2005). Contributing knowledge to electronic knowledge repositories: an empirical investigation. *MIS Q.* 29, 113–143. doi: 10.2307/25148670
- Katz, E., and Blumler, J. G. (1974). *The Uses of Mass Communications: Current Perspectives on Gratifications Research*. Thousand Oaks, CA: Sage Publications.
- Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling*. New York, NY: Guilford publications.
- Krebs, D. (1975). Empathy and altruism. *J. Pers. Soc. Psychol.* 32:1134.
- Krishna, A., Lazarus, D., and Dhaka, S. (2013). Co-creation channel: a concept for paradigm shift in value creation. *J. Manag. Sci. Pract.* 1, 14–21.
- Kumari, R., Kwon, K.-S., Lee, B.-H., and Choi, K. (2020). Co-creation for social innovation in the ecosystem context: the role of higher educational institutions. *Sustainability* 12:307. doi: 10.3390/su12010307
- Kuznar, K. A. (2009). *Effects of High-Fidelity Human Patient Simulation Experience on Self-Efficacy, Motivation and Learning of First Semester Associate Degree Nursing Students*. Pennsylvania, PA: CiteSeer.
- Laine, K., van der Sijde, P., Lähdeniemi, M., and Tarkkanen, J. (2008). *Higher Education Institutions and Innovation in the Knowledge Society*. Helsinki: Oy Nord Print Ab.
- Liebowitz, J. (2002). Facilitating innovation through knowledge sharing: a look at the US naval surface warfare center-carderock division. *J. Comput. Inf. Syst.* 42, 1–6.
- Mallasi, H., and Ainin, S. (2015). Investigating knowledge sharing behaviour in academic environment. *J. Organ. Knowl. Manag.* 2015, 1–19.
- Maurer, T. J., Weiss, E. M., and Barbeite, F. G. (2003). A model of involvement in work-related learning and development activity: the effects of individual, situational, motivational, and age variables. *J. Appl. Psychol.* 88, 707–724. doi: 10.1037/0021-9010.88.4.707
- McColl-Kennedy, J. R., Vargo, S. L., Dagger, T., and Sweeney, J. C. (2009). “Customers as Resource Integrators: Styles of Customer Co-Creation. Passage du Nord: EIASM, 1–24.
- McElroy, J. C., Hendrickson, A. R., Townsend, A. M., and DeMarie, S. M. (2007). Dispositional factors in internet use: personality versus cognitive style. *MIS Q.* 31, 809–820. doi: 10.2307/25148821
- Mehrabian, A., and Russell, J. A. (1974). *An Approach to Environmental Psychology*. Cambridge, MA: MIT Press.
- Memon, M., Ting, H., Ramayah, T., Chuah, F., and Cheah, J. (2017). A review of the methodological misconceptions and guidelines related to the application of structural equation modeling: a Malaysian scenario. *J. Appl. Struct. Equ. Modeling* 1, 1–13. doi: 10.1016/s0191-2615(01)00046-7
- Meuter, M. L., Bitner, M. J., Ostrom, A. L., and Brown, S. W. (2005). Choosing among alternative service delivery modes: an investigation of customer trial of self-service technologies. *J. Mark.* 69, 61–83. doi: 10.1509/jmkg.69.2.61.60759
- Monavarifad, F., Baradaran, M., and Khosrviour, B. (2019). Increasing the sustainability level in agriculture and natural resources universities of iran through students’ engagement in the value co-creation process. *J. Clean. Prod.* 234, 353–365. doi: 10.1016/j.jclepro.2019.06.175
- Morgan, R. M., and Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *J. Mark.* 58, 20–38. doi: 10.2307/1252308
- Nambisan, S. (2002). Designing virtual customer environments for new product development: toward a theory. *Acad. Manage. Rev.* 27, 392–413. doi: 10.2307/4134386
- Nambisan, S., and Baron, R. A. (2009). Virtual customer environments: testing a model of voluntary participation in value co-creation activities. *J. Prod. Innov. Manag.* 26, 388–406. doi: 10.1111/j.1540-5885.2009.00667.x
- Nambisan, S., and Nambisan, P. (2008). How to profit from a better virtual customer environment. *MIT Sloan Manage. Rev.* 49, 53–61.
- Newman, A., and Sheikh, A. Z. (2012). Organizational commitment in Chinese small- and medium-sized enterprises: the role of extrinsic, intrinsic and social rewards. *Int. J. Hum. Resource Manage.* 23, 349–367. doi: 10.1080/09585192.2011.561229
- Oreg, S., and Nov, O. (2008). Exploring motivations for contributing to open source initiatives: the roles of contribution context and personal values. *Comput. Hum. Behav.* 24, 2055–2073. doi: 10.1016/j.chb.2007.09.007
- O’Reilly, C., and Pondy, L. (1979). Organizational communication. *Organ. Behav.* 119:150.
- Payne, A. F., Storbacka, K., and Frow, P. (2008). Managing the co-creation of value. *J. Acad. Mark. Sci.* 36, 83–96.
- Pereira, M. A. C., and Da Silva, M. T. (2003). *A Key Question for Higher Education: Who are the Customers*.
- Preacher, K. J., and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/BRM.40.3.879
- Quinn, J. B., Anderson, P., and Finkelstein, S. (1998). Managing professional intellect: making the most of the best. *Strateg. Manage. Intelect. Capital* 74, 71–80.
- Ramayah, T., Cheah, J., Chuah, F., Ting, H., and Memon, M. A. (2018). *Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3.0: An Updated Guide and Practical Guide to Statistical Analysis*. Kuala Lumpur: Pearson.
- Redding, P. (2005). The evolving interpretations of customers in higher education: empowering the elusive. *Int. J. Consum. Stud.* 29, 409–417. doi: 10.1111/j.1470-6431.2005.00465.x
- Ringle, C. M., Wende, S., and Becker, J.-M. (2015). *SmartPLS 3*. Boenningstedt: SmartPLS GmbH.
- Roy, S. K., Singh, G., Hope, M., Nguyen, B., and Harrigan, P. (2019). The rise of smart consumers: role of smart servicescape and smart consumer experience co-creation. *J. Mark. Manage.* 35, 1480–1513. doi: 10.1080/0267257x.2019.1680569
- Ryan, R. M., and Deci, E. L. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp. Educ. Psychol.* 25, 54–67. doi: 10.1006/ceps.1999.1020
- Šajeva, S. (2014). Encouraging knowledge sharing among employees: how reward matters. *Procedia Soc. Behav. Sci.* 156, 130–134. doi: 10.1016/j.sbspro.2014.11.134
- San Cornelio, G., and Gomez Cruz, E. (2014). Co-creation and participation as a means of innovation in new media: an analysis of creativity in the photographic field. *Int. J. Commun.* 8, 1–20.
- So, K. K. F., King, C., and Sparks, B. (2014). Customer engagement with tourism brands: scale development and validation. *J. Hosp. Tour. Res.* 38, 304–329. doi: 10.1177/1096348012451456
- Sutarso, Y., Halim, R. E., Balqiah, T. E., and Tjiptoherijanto, P. (2019). Understanding customer co-creation activities in higher education: groupings, characteristics and implications. *In. J. Bus. Soc.* 20, 42–56.
- Vargo, S. L., and Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *J. Mark.* 68, 1–17. doi: 10.1509/jmkg.68.1.1.24036
- Vargo, S. L., and Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *J. Acad. Mark. Sci.* 36, 1–10. doi: 10.1007/s11747-007-0069-6
- Waas, T., Verbruggen, A., and Wright, T. (2010). University research for sustainable development: definition and characteristics explored. *J. Clean. Prod.* 18, 629–636. doi: 10.1016/j.jclepro.2009.09.017
- Wasko, M. M., and Faraj, S. (2000). “It is what one does”: why people participate and help others in electronic communities of practice. *J. Strateg. Inf. Syst.* 9, 155–173. doi: 10.1016/s0963-8687(00)00045-7
- Wasko, M. M., and Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Q.* 29, 35–57. doi: 10.2307/25148667
- Webster, J., and Ahuja, J. S. (2006). Enhancing the design of web navigation systems: the influence of user disorientation on engagement and performance. *MIS Q.* 30, 661–678. doi: 10.2307/25148744
- Welschen, J. E. (2014). *An Investigation of the Impact of Extrinsic and Intrinsic Motivators on Organisational Knowledge Sharing*. Christchurch: University of Canterbury.

- Wetzels, M., De Ruyter, K., and Van Birgelen, M. (1998). Marketing service relationships: the role of commitment. *J. Bus. Indust. Mark.* 13, 406–423. doi: 10.1108/08858629810226708
- Zhang, H., Lu, Y., Wang, B., and Wu, S. (2015). The impacts of technological environments and co-creation experiences on customer participation. *Inf. Manage.* 52, 468–482. doi: 10.1016/j.im.2015.01.008
- Zhang, K. Z., and Benyoucef, M. (2016). Consumer behavior in social commerce: a literature review. *Decis. Support Syst.* 86, 95–108. doi: 10.1016/j.dss.2016.04.001
- Zhao, X., Lynch, J. G., and Chen, Q. (2010). Reconsidering baron and kenny: myths and truths about mediation analysis. *J. Consum. Res.* 37, 197–206. doi: 10.1086/651257

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Virtual Teams in Times of Pandemic: Factors That Influence Performance

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In the digital age, the global software development sector has been a forerunner in implementing new ways and configurations for remote teamwork using information and communication technologies on a widespread basis. Crises and technological advances have influenced each other to bring about changes in the ways of working. In the 70's of the last century, in the middle of the so-called oil crisis, the concept of teleworking was defined using remote computer equipment to access office equipment and thus avoid moving around using traditional vehicles. Then from the 90s, with the advent of communications and the widespread use of the Internet, the first virtual work teams were implemented in software development companies that already had some of the important characteristics needed to work in this way, such as, cultural diversity, characterized tasks, geographical distribution of members, communication, interdependence of tasks, leadership, cohesion, empowerment, confidence, virtuality. This manuscript groups the main factors into different models proposed by the literature and also analyzes the results of a study conducted in the midst of the Covid-19 crisis on 317 software development teams that had to work in virtual teams (VT). The results of the quantitative methodology with structural equation modeling based on variance using the partial least squares route method are analyzed. The results of the research focus on some determinants that can directly affect the performance of the virtual team. A first determinant is communication in relation to the tasks. The second is trust in relation to leadership, empowerment and cohesion. The results of virtual teams provide information that can serve as a basis for future research lines for the implementation of virtual work strategies in post-pandemic work.

Keywords: global software development, COVID-19, virtual teams, determinants of performance, PLS-SEM

INTRODUCTION

The digital era has meant a change in the processes and routines of the business dynamics to which many organizations have had to adapt in order to compete and survive in globalized markets. The virtualization of organizational life and the digital transformation of labor relations goes hand in hand with the accelerated advance of technologies such as cloud computing, which have made it unnecessary to have tangible servers, software and hardware infrastructures in the company offices and many processes are being carried out by accessing personal equipment or terminals (computers, laptops, and mobile devices) connected to an increasingly fast Internet network. All this is possible thanks to the technology of virtualization (Sánchez, 2017). Recent studies have analyzed the attitude

of human resources to cloud technology and its importance in software as a service application - SaaS- (Palos and Correia, 2017) and how the attitude of the worker has changed, thanks to online work training (Palos-Sanchez, 2017). Thus, the digital virtualization of traditionally physical technological resources is also happening at the level of human resources, because increasingly the presence of workers in the same place is not necessary. This implies an immense challenge for the new electronic leadership of teams of collaborators who are increasingly dispersed geographically.

In the beginning, virtual teams were formed to facilitate joint creation and innovation among global or regional experts who did not have enough time to travel to fulfill the specialized tasks of the projects that required them. Today, virtual teamwork has evolved to a point where online collaboration is a way of working for national companies and more naturally for multinational or regional companies. The idea of virtual collaboration between workers, or virtual teamwork VT, consists of a team working together from different physical locations using collaborative ICTs. In the last 20 years this modality has been in constant growth due to the evolution and maturity of the digital era in terms of speed of telecommunications, the power of the computer equipment, the naturalness of adaptation to the use of ICTs in the work of digital natives (born since 1990) and digital migrants (born before 1990). However, at the beginning of the 21st century it was difficult to have faith in VTs due to the low level of maturity of virtual teams which made companies skeptical about the efficiency of this way of working. By the early 2000s, studies showed that the number of VTs that achieved their goals was not very encouraging and there was a significant failure rate. A few years later, things had not changed that much either. In 2004, there was talk of significant challenges in the implementation of virtual teams (Piccoli et al., 2004). Another study (Brett et al., 2006) revealed that most people thought that virtual communication was not as productive as face-to-face interaction, while half of the respondents said they were confused and overwhelmed by collaboration technology. Even so, this happened a few years ago and as technology advanced, companies matured with the use of ICT tools, so these early conclusions from the beginning of the century were not believed to be accurate anymore. A more recent study in 2009, involving 80 global software teams, indicated that well-managed virtual teams using virtual collaboration can outperform face-to-face (FtF) teams.

Additionally, a number of studies (Jarrahi and Sawyer, 2013), indicate that virtual or remotely distributed team collaboration can also improve employee productivity. Therefore, an important question is: what can make a virtual team have better performance results than a face-to-face team? The answer has been provided by several studies that have summarized input factor models and their relationships with other factors grouped into socio-emotional and task-oriented processes and finally their relationships with output factors (Powell et al., 2004; Gilson et al., 2015).

In addition to the aforementioned triggers of virtualization of organizational life and the digital transformation of processes (Zúñiga Ramirez et al., 2016) and the interrelations of stakeholders as co-creators of value (Martinez-Cañas et al., 2016;

Ribes-Giner et al., 2017), it is also worth mentioning that the origin of remote work in a virtual team is originally teleworking.

Considering the above reasons and in view of finding ourselves in the midst of a rapidly evolving digital era coupled with a pandemic that has forced workers in many areas to perform remote work (Velicia-Martin et al., 2021) and aligned with an effective strategy to contain and mitigate rate of spread of infection (Brooks et al., 2020), this study has been undertaken in the midst of the COVID19 impact on virtual teams in the software development industry. The co-creation in virtual teamwork is a very important feature.

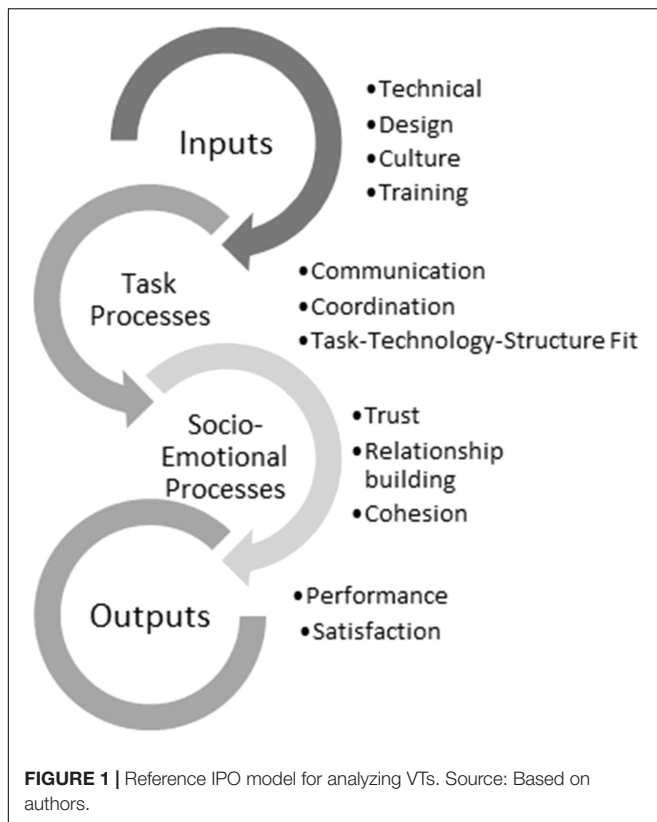
The main objective of this research, at a time with a pandemic and the current digital era (Chen et al., 2020), is to analyze the relationship of important factors found in the literature by analyzing the performance of 317 software engineers in virtual teams. Software engineers, due to their training and experience, belong to virtual teams that include co-creation for the construction of software using agile methodologies and have recently been involved in working in virtual teams. This research is original because of the importance given to endogenous variables such as communication and trust. For this reason, the results of the survey carried out have served to understand what role different factors play in the performance of a group used to doing remote or virtual teamwork as part of their normal work. The study uses a structural equation approach with partial least squares (PLS) to evaluate the proposed performance model. The research is organized as follows. First, the Introduction explains the article based on the history of co-creation in current software development and its relationship to the study of vital equipment. Then there is a literature review, which analyzes relevant research on factors in VTs. Thirdly, methodology and justification of the hypotheses are presented. The results are then analyzed. In the Conclusions section, discussions and conclusions are made in which the practical implications of the research are given.

LITERATURE REVIEW

A virtual team is defined as a group of people or stakeholders working together from different locations and possibly different time zones, who are collaborating on a common project and use information and communication technologies (ICTs) intensively to co-create. It can be seen that one of the main characteristics is virtuality, which implies physical and temporal distance between members and a shared purpose (Ebrahim et al., 2009).

Another essential characteristic of virtual teams, which differentiates it from traditional “face-to-face” (FtF) teams is the collaborative use of technology for work. This has been the result of the evolution of ICTs in this digital age, along with the trend toward globalization. In VTs there is naturally a geographical dispersion that entails certain cultural differences and social bonds are more difficult to achieve. All this generates a series of difficulties for communication between members and emotional relationships (Duarte and Snyder, 2006; Lin et al., 2008; Shuffler et al., 2010).

Virtual teams are affected by a series of factors and phases, which have been investigated in the literature



(Abarca et al., 2020) and which give rise to different models for studying and relating them for performance. There are several models of VTs, from classical ones (Martins et al., 2004; Powell et al., 2004) to a recent one (Dulebohn and Hoch, 2017). Others analyze VTs at the management level (Hertel et al., 2005) and others analyze them as a systemic Input-Process-Output or IPO (Saldaña Ramos, 2010). This last model is based on others that studied face-to-face teams (Hoch and Kozlowski, 2014) and proposes adaptations to the model when studying VT.

Research papers study the factors that influence VTs for virtual team management models and those that have a significant impact on performance are chosen and, in turn, are mentioned in the literature. As seen in **Figure 1**, this study has taken into account the different phases of the IPO model and its adaptation (Gilson et al., 2015) along with the factors that are organized into Inputs (related to communication and trust), Processes (task-oriented and socio-emotional) and Outputs (performance).

Inputs

As observed in VT models, communication is studied in relation to the characteristics of the tasks that will be developed and co-created in a distributed way.

Task Features

The interaction between task type and communication and its impact on team performance has been investigated in the literature (Montoya-Weiss et al., 2001; Bell et al., 2002; Rico and Cohen, 2005). Because virtual teams rely heavily on

communication technologies to coordinate their work, it is necessary to examine the relationship between the nature of the task and the effectiveness of communication that impacts team performance.

Software development projects are characterized by great uncertainty in terms of requirements and risk planning and followed by technological suitability until the project is completed. Task uncertainty has been conceptualized using various dimensions of task complexity in the literature. Some of the dimensions studied are task variety and task analyzability (Daft and Lengel, 1986); variability (de Ven et al., 1976); uniformity (Mohr, 1971); predictability (Galbraith, 1973); and complexity (Duncan, 1972). The proposed model of information processing by Daft and Macintosh (1981) is comprehensive and captures the nature of virtual teamwork effectively through the dimensions of task variety and task analyzability.

Trust

As seen in the VTs models, trust is considered as leadership, cohesion and team empowerment. These 3 characteristics are described in more detail below:

Leadership

One definition of leadership states that it is when a person gets other people to do something (Kort, 2008). Leadership is an influential relationship between leaders and followers who attempt to make changes that benefit their mutual purposes (Kort, 2008).

In VTs, transformational leadership seems to also arise from personality and communication factors (Balthazard et al., 2009) and can increase performance, satisfaction (Purvanova and Bono, 2009) and motivation (Andressen et al., 2012).

Clearly, leadership is important for VTs. In one study (Glückler and Schrott, 2007) it was found that communication influenced who emerged as a leader.

Glückler and Schrott (2007) found that communication behavior influenced who emerged as a leader. Similarly, leader-member exchange (Goh and Wasko, 2012), perceptions of supportive leadership (Schepers et al., 2011), leadership roles (Konradt and Hoch, 2007) and cross-cultural leadership (Sarker et al., 2009) have received attention, and other research has studied the impact of the type of recognition a leader uses to motivate workers (Whitford and Moss, 2009).

Research on VT leadership has grown rapidly, with two popular areas being leadership behavior and traits (Gilson et al., 2015). Here, the work has examined inspirational aspects (Joshi et al., 2009) as well as transformational and transactional leaders (Huang et al., 2010; David Strang, 2011). In VT, transformational leadership seems to be due to personality and communication factors (Balthazard et al., 2009) and can increase performance, satisfaction (Purvanova and Bono, 2009) and motivation (Andressen et al., 2012).

Several studies have examined the interaction between leadership and virtuality, finding that team members are more satisfied with their team and leader and perceive that their leader is better able to decode messages when the leader is geographically distant from the team (Henderson, 2008).

Hoch and Kozlowski (2014) found that virtuality dampened the relationship between hierarchical leadership and performance while improving the relationship between structural supports and performance.

Clearly, leadership within VTs is important. As such, leaders can play a central role in how a VT works, particularly because they influence how a team deals with obstacles and how the team ultimately adapts to such challenges. This can be seen in articles on team adaptation research (Baard et al., 2014).

Other research suggests that classic leadership styles are appropriate for a virtual team:

Democratic (McBer and Company, 1980) and referee leadership styles (Rashid and Dar, 1994) have some characteristics that are very suitable for a virtual team. One negative factor could be that many meetings are needed to reach consensus. In a virtual team, it is difficult and time-consuming to hold meetings for each decision.

Operational leadership (McBer and Company, 1980) may be a good option because this leadership style gives team members clear roles and tasks. In addition, the leader makes the processes and structures very clear, so lack of communication will be reduced. A negative feature of this style of leadership for virtual teams might be that the contribution of the team members, and their responsibilities, might be a little less than the team members want.

Coaching leadership (McBer and Company, 1980) fits virtual teams very well because it gives a lot of freedom to the team members, which means that they are also responsible for their work and results. Team members can set their own goals and therefore also progress personally while working in the virtual team. This leadership style, however, also has some difficulties. The processes, structures and roles of the team may not always be very clear because the leader allows team members to establish and use their own. Therefore, the success of the virtual team might suffer a little.

Cohesion

According to Salisbury et al. (2006) research into classical teams (Lott and Lott, 1965; Hogg, 1987) suggest that the physical distance between members can be translated into a psychological distance between them. Following this line of reasoning (Salisbury et al., 2006) the physical dispersion of the virtual team could inhibit cohesion. In addition, virtual team members may have different ideas about what cohesion is. In other words, the idea of cohesion, which is the communication between group members, is affected by the medium used to communicate. This is especially true given the ease with which users can exchange non-task related information in some environments. Clearly, the differences in communication patterns between virtual and onsite teams suggest that measures (such as PCS) which are used in one context cannot be directly employed in another without reevaluating them (Boudreau et al., 2001).

Studies about group behavior (Hogg and Tindale, 2001) consistently report that, in working groups, the members' ability to get along with each other is critical for well-being and task performance. The importance of developing such intra-group cohesion has been shown to be especially relevant in cases

where members do not know each other, such as in newly formed groups or when members are assigned to new project teams (Griffin, 1997). The Symbolic Convergence Theory (SCT) proposed by Bormann (1983, 1996) and tested by Bormann et al. (1994, 1997) provides a rich theoretical framework for understanding group cohesion in traditional and technology-based teams.

One type of group cohesion is task cohesion and occurs when members stay together because they are strongly involved with the group's tasks. Task cohesion will be greater if members identify with the group's tasks and find them intrinsically rewarding and valuable.

Group cohesion for virtual teams with members working at different geographic locations, for different organizations, and even in different sectors of the economy, need effective communication and close coordination to achieve goals (Powell et al., 2004).

The positive relationship between cohesion and trust in working teams has been confirmed in many investigations (Evans and Dion, 1991; Simons and Peterson, 2000; Baltes et al., 2002; Powell et al., 2004; Spector, 2006; Lu, 2015).

Empowerment

Empowerment is favorable acknowledgment by the team leader and allows team members to participate in decision making. Empowerment makes the team member trust the leader, and when the leader asks for opinions and comments, he or she processes them and makes decisions based on the suggestions.

Some past studies (Kirkman et al., 2004) indicate that teams can be empowered in four different ways, (a) power, which is the collective belief that a team can be effective, (b) significance, which is the extent to which team members care about their tasks, (c) autonomy, in which team members have freedom to make decisions; and (d) impact, the degree to which team members feel that their tasks make important contributions.

The impact of team empowerment on the performance of EVTs in 10 telecommunications companies in Islamabad was studied by Gondal and Khan (2008). That study found that there is a positive relationship between team empowerment and team performance in telecommunications teams. Team performance includes the variables of cooperation, coordination, trust, cohesion, effort, mutual support, team conflict, job satisfaction and effectiveness in terms of quality.

Kirkman et al. (2004) also studied 35 sales and service teams at a high-tech firm and investigated the impact of team empowerment on team performance and the intermediary role of face-to-face interaction. They found that team empowerment is positively related to both constructs of virtual team performance, which are process improvement and customer satisfaction.

As indicated (Kirkman et al., 2004) empowerment in a virtual team can be a substitute for the leadership tasks of a single team leader (Kerr and Jermier, 1978). The behavior of the team members due to the leader's empowerment is directly and positively related to trust. It is considered a confidence-building attribute. For empowerment, commitment is only reached when the team has a shared vision and honest and regular communication with the leader.

Processes

Models usually study the processes of tasks by investigating communication and the social-emotional processes of trust. The degree of virtuality and the interrelationship of tasks are also considered important for performance.

Communication

In mixed teams, where some members are at the same physical location and others are not, communication problems can also occur. Team members at the same physical place often communicate in a deeper way than with the distant members and this ends up causing friction between them and, therefore, damages the performance of the team (Powell et al., 2004).

Communication, coordination and knowledge sharing are essential elements of action processes to predict the efficiency and effectiveness of the team (Kock and Lynn, 2012).

Another study (Peñarroja et al., 2013) found that as virtuality increased, team coordination declined, but this relationship was partially mediated by levels of trust.

Early research on VTs proposed that initial FtF meetings should help encourage performance (Geber, 1995). Han et al. (2011) extended this line of reasoning to creativity and compared modes of initial communication to assess their impact.

Trust

Understanding how, why, and under what conditions trust develops remains a popular research topic. In part, the importance of trust can be attributed to results that suggest it positively affects the success of VTs (Furumo, 2009).

For VTs, trust is influenced by communication behavior, timely responses, open communication, and feedback (Henttonen and Blomqvist, 2005).

More recent findings suggest that rapid trust is likely to be established with early communication and a positive tone (Coppola et al., 2004) and may influence performance by improving member confidence and subsequent trust (Crisp and Jarvenpaa, 2013).

Other research has studied the impact of global VTs on trust development (Lowry et al., 2010). Culturally heterogeneous teams (China and the United States) and homogeneous teams were compared and no significant differences were found in the trust between FtF teams and VTs (Lowry et al., 2010).

Furthermore, in a longitudinal study of global VTs, Goh and Wasko (2012) found that when everyone's actions were visible, trust was not a key factor in resource allocation.

Finally, in globally distributed teams, trust mitigated the negative effects of member diversity on performance (Garrison et al., 2010).

Output

Finally, aspects such as performance, quality of the product or service obtained and member satisfaction are relevant for the results. Of course, performance is the essential variable and is the usual interest of research into virtual teams.

Performance

Overall, research suggests that working in VTs can have a positive impact on effectiveness (Kock and Lynn, 2012; Maynard et al., 2012), while others provide evidence suggesting that virtual working affects effectiveness negatively (Cramton and Webber, 2005; Schweitzer and Duxbury, 2010).

A positive trend appears to be that work in this area is beginning to take advantage of ratings from outside the team (Andressen et al., 2012; Cummings and Haas, 2012), as well as objective measures of team performance (Rico and Cohen, 2005; Rapp et al., 2010).

In considering the elements of effectiveness, several researchers have examined the quality of the project (Altschuller and Benbunan-Fich, 2010). This makes sense, since VTs are often used for special projects. In addition, the quality of the decisions made and the time taken to reach a decision have been studied and the findings are often that VTs need more time to make decisions (Pridmore and Phillips-Wren, 2011).

Other studies find that VTs that set goals early in their life cycle showed greater cohesion and performance (Brahm and Kunze, 2012).

Other work in this area also suggests that team motivation and performance can be improved by using mixed incentive rewards (Bryant et al., 2009).

One study (Kirkman et al., 2013) considered the impact of national diversity on performance and found a curvilinear (U-shaped) relationship moderated by both media richness and psychological safety.

MATERIALS AND METHODS

The present study was carried out to understand the factors which influence the performance of VTs in a professional team that is used to using "agile" methodologies and virtual working.

A quantitative causal study using partial least squares (PLS) was performed using an online questionnaire, with a sample of 317 participants (Software Engineers).

Questionnaire and Measurement Scales

A quantitative research divided into the following blocks was designed and then carried out and the results were used to test the hypotheses that constitute the theoretical model. The details are shown in **Table 1**.

Proposed Model

The proposed model that incorporated the hypothetical relationships is illustrated in **Figure 2**.

Research Hypotheses

The research hypotheses for the investigation of the factors that influence the performance of virtual teams are presented below.

Considerations of the Research Approach in the Hypotheses

Due to the quantitative approach chosen and by virtue of the delimiting nature of quantitative research, the hypotheses

TABLE 1 | Variables of the proposed model.

Variable	Definition	Authors
Task characteristics	Represent elements of task uncertainty that have been the basis of many studies of organizational structure and process (Perrow, 1967)	Daft and Macintosh, 1981; Campion et al., 1993
VT communication	Defined as when group members must be able to clearly and explicitly exchange information to effectively support collaboration (Lowry et al., 2006).	Dennis and Kinney, 1998; Lowry et al., 2006; Makoul and Curry, 2007
Leadership	Defined as a dynamic process of social problem solving accomplished through generic responses to social problems (Burke et al., 2006)	Burke et al., 2006
Cohesion	Defined as the commitment of each team member to remain united in the pursuit of the team's goals and to each member's affective needs (Subramanyam, 2013).	Warkentin and Beranek, 1999; Wei et al., 2018
Empowerment	Defined as the collective belief in a group that it can be effective, and its role in determining group effectiveness (Guzzo et al., 1993).	Guzzo et al., 1993
Trust	Is a crucial factor in forming and maintaining social relationships and is key for cooperative relationships and effective teamwork (Alsharo et al., 2017)	Guzzo et al., 1993; De Jong and Elfring, 2010; Alsharo et al., 2017
Performance	Is the ability to work at the highest level of effectiveness for an extended period of time. This means delivering quality products on time, within budget, while satisfying stakeholders (Pitagorsky, 2007).	Fuller et al., 2006; Dayan and Di Benedetto, 2010; Alsharo et al., 2017

constitute the behavior that the variables or constructs are expected to show in the software development VT environment. **Figure 2** shows the initial model. The hypotheses that are to be tested in this study are presented below:

H1: The characteristics of the tasks have a direct and positive influence on the communication of the virtual team members.

H2: The level of leadership of the members of the virtual team has a direct and positive influence on trust.

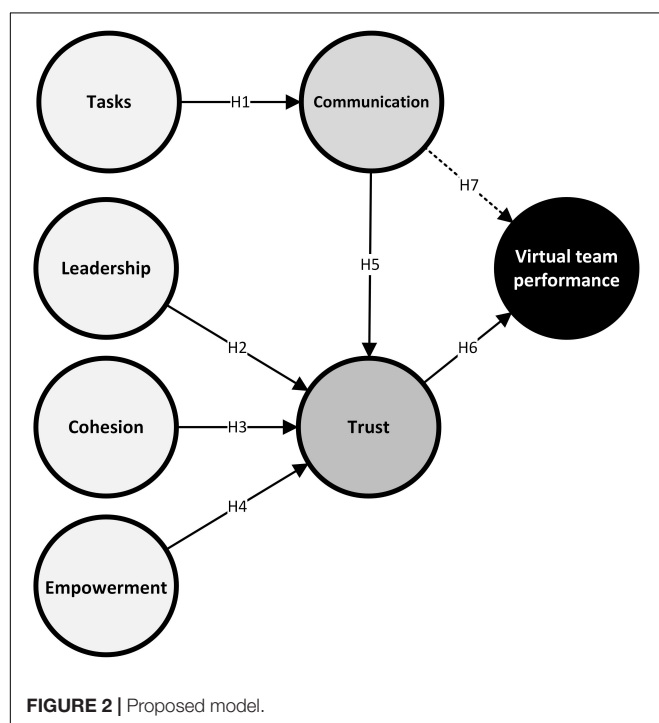
H3: The level of cohesion of the members of the virtual team has a direct and positive influence on trust.

H4: The level of empowerment of the members of the virtual team has a direct and positive influence on trust.

H5: Communication between virtual workers has a direct and positive influence on the confidence of the virtual team.

H6: Trust among virtual workers has a direct and positive influence on the performance of the virtual team.

H7: The level of communication between virtual workers has a direct and positive influence on the performance of the virtual team.

**FIGURE 2** | Proposed model.

Hypothesis Research Scope Considerations

The correlational scope used to find the relationships between variables that give an answer to a problem means that without proving these relationships there could be a causal link between the variables. **Figure 2** shows the constructs of the hypotheses in the study model.

Additionally, it is important to reiterate, that the VT performance construct is based on the relationships with the aggregate constructs Communication (h9) and Trust (h10) which in turn are expected to have a strong relationship between them and this will be tested in the research (h7 and h8). Then, the latent variable called communication has the constructs of cultural diversity (h1), the characteristics of the tasks (h2), as well as the distribution index (h3). Finally, the variables leadership (h4), cohesion (h5), and empowerment (h6) are used to find the latent variable trust.

The model used for the research hypotheses, its variables and its relationships are described in the literature review section.

Sampling and Data Collection

1,200 software engineers with experience in programming with Agile methodology (which involves co-creation and collaboration in virtual teams) and who had graduated in the

last 10 years, were directly invited to take part in the survey. 317 responses were collected.

RESULTS

Strengths

The study was designed based on robust studies previously applied to telework and virtual teams in globally distributed teams for 20 years and after a robust literature review on the most relevant factors affecting the performance of these teams.

The study was applied at a privileged moment 3 months after the official declaration of the Covid pandemic19 by The World Health Organization.

The population taken into account for this study is considered stable because they were graduates of accredited engineering degrees from universities recognized in Costa Rica for their training in software development over the past 20 years and related colleagues.

Parallel to this study, a control study was conducted on another more heterogeneous population of professionals who in many cases had to start from scratch in the form of teleworking or virtual teams. This helped to understand and further refine the proposed model.

Demographic Details

As can be seen in **Table 2**, the results found for the demographic features of the 317 members of virtual teams that use agile methodologies for the development of their projects are tabulated.

For gender, it is normal that in Software Engineering (SE) there is a higher proportion of men (81%) than women (19%). For age, it should be noted that 65% of those who responded to the questionnaire about virtual teams of SE were digital natives (born after the 1990s).

For the time spent working in VTs, almost 90% of the young members of SE VTs had joined in the last 5 years, which is consistent with handling agile methodologies and virtual teams in this profession.

The proportion of leaders is approximately 30% of the group and members 70%. In the SE VTs it was notable that 58% of the members have also been project leaders before, due to the dynamics of the Agile methodology and value co-creation. The diversity of membership in organizations shows that the members from SE VTs were 25% of the sample group and the members of VTs from other professions (OP) were 5% due to their recent incorporation into this way of working.

The members of SE VTs (68%) were very interested in continuing working in VTs in a new post-Covid19 normality.

Important Findings

It is clear that the objective of the work is to analyze the determinants of performance in virtual teams in a time of pandemic, where conditions forced the vast majority of workers to develop their work within their homes remotely,

TABLE 2 | Demographic details.

Demographic details	Software engineering
Universe	
n = 317	
%	100.00%
Gender	
Male	81.07%
Female	18.93%
Age	
18–29	64.98%
30–39	18.93%
40–49	10.41%
50–59	4.73%
60 or +	0.95%
Time using VT	
<1 year	58.99%
2–5 years	28.71%
6–10 years	7.57%
11–15 years	2.84%
16 or + years	1.89%
Leader now	
Leader	29.65%
Member	70.35%
Leader before	
Yes	58.04%
No	41.96%
Same Organization	
Yes	76.34%
No	23.66%
Share Knowledge	
Yes	65.93%
No	34.07%
Future in VT	
Yes	68.45%
No	2.84%
Maybe	28.71%

forming virtual teams in which they already participated or had to organize in this way. With this objective, a survey has been conducted among software engineers and they have specified a structural equation model to analyze the relationship between different inputs and processes in the output. The results obtained show the relevance of communication and confidence in the performance of virtual teams. But before reviewing the complete model it is important to mention some important findings:

- The participants in this study were professionals in the area of computer science, dedicated to the development of software. Mainly digital natives with experience in VTs, people with ages between 18 and 29 years (64.98%) and digital migrants between 30 and 39 years (18.93%) with high mastery of information and communication technologies ICTs. In general, they consider that virtual teamwork is an excellent way to develop their work in the world of technology. It is part of their profession. In the worst case, some engineers maintain a neutral stance toward the issue of virtual teamwork. Under normal conditions they have worked in virtual mixed mode and

face to face, so under 100% pandemic conditions, they really didn't have much of an adjustment problem, because they were already doing it before. Even when asked about the future, a high number (68.45%) see themselves working in virtual teams and 28.71% in mixed mode.

- The professionals interviewed in many cases have indicated that communication in virtual teams is a factor that must be improved in frequency and quality because they feel that the initial instructions are not enough. Others take communication as a natural factor, regardless of whether the communication is virtual or face to face. Finally others indicate that communication in the virtual team is better with the good use of collaborative tools.
- Trust is a very important factor in the study, because it allows employees to perform their tasks at a distance in a better way, as long as their tasks are measured by objectives. Too many controls throughout the work process make the virtual collaborator feel watched and that he is being evaluated negatively.
- Regarding the geographical distribution, software engineers agree with professionals from other areas in that it saves them time and money and due to the intensive and natural use of ICT in their profession, the physical distance was not relevant to achieve the objectives.
- Regarding the cultural diversity in this study, being regional, the interviewees gave positive answers because the cultural differences did not influence their performance in the software development projects that have in common in a standardized way the computational language and the technological architectures.
- About the distribution of tasks, to be developed projects with agile methodologies, the specifications of functional and technical requirements are very clear from the beginning and also are clarified or refined in time with the coordination, co-creation and collaborative work, so engineers have clear what their tasks are throughout the process. As for the Interdependence of tasks there was no significant finding at the level of software development operations. It is possible that this is due to the fact that software projects are structured at the level of by-products and tasks in an orderly manner.
- By using agile methodologies to develop work with virtual teams and distributing tasks among members early on, empowering each member individually and in relation to others has been vital in software projects. Depending on the level of experience and individual skills, empowerment is increasingly important in virtuality.
- Leadership is a fundamental issue, which directly influences the confidence of virtual collaborators. In this study the members of the virtual teams gave it a moderate importance because of the work methodology and the mixed experience: virtual and face to face, the works are done in a collaborative and very horizontal way. Additionally, 58.04% indicated that they had already led some software development in this modality in the past.

- The virtual team software development has made the collaborators work longer interacting through the ICTs, fighting to achieve common objectives. This has made that the cohesion between them has increased at work level.

Sample Frame

A random database of 1,000 software engineers graduated in the last 20 years from accredited software engineering or systems engineering careers at universities in Costa Rica, a country with a tradition and recognition of many years of software development for the region of Central and North America (mainly United States), was taken into account.

The survey was applied from May to July 2020, in the midst of the Covid19 pandemic, using an email invitation for respondents to fill out an electronic survey instrument using the Google Forms platform with 65 items.

Limitations

There are many factors previously studied that influence in one way or another the performance of VTs, but at the level of the proposed model they cannot all be included because they have shown that their influence has not been very strong or because the type of population that was chosen for this specific study was not relevant. For example, a limitation of this study is that the dimension of rewards was not considered, since in recent similar studies they have not shown significant relationships (Tan et al., 2019).

A second limitation that could be considered, is related to the fact that, the respondents belong to different institutional environments, regularly projects of 5–10 members, in medium sized software development companies. In this sense, it is common that they use agile methodology as the project organization standard, which compensates for the differences in size of the parent organization, type of products developed, the member's country of origin and the country of origin of the final client.

The cultural diversity that has been extensively studied in virtual teams, in this study was included in the survey but its results did not show a significant influence because the software development projects were usually regional and associated with the same continent and time zones with few differences.

ANALYSIS OF RESULTS

Results for the Measurement Model

The measurement model was tested for internal reliability, convergent validity and discriminant validity. The internal reliability was evaluated using Cronbach's alpha which needs a value of at least 0.70 for acceptable internal consistency (Hair et al., 2013). Causality was analyzed using indicator loadings. Composite reliability was also used to investigate causality (Werts et al., 1974). All the constructs had internal consistency as all the values for Cronbach's alpha were higher than 0.7 (Fornell and Larcker, 1981; Bagozzi and Yi, 1988; Hair et al., 2011). Fornell and Larcker (1981) used the Average Variance Extracted (AVE)

TABLE 3 | Reliability, validity of the constructs, Fornell–Larcker criterion and HTMT.

Const	Alfa de Cronbach	CR	AVE	Fornell–Larcker criterion						HTMT						
				TASK	COH	COM	TRU	PER	EMP	LEAD	TASK	COH	COM	TRU	PER	EMP
TASK	0.851	0.910	0.771	0.878												
COH	0.880	0.912	0.676	0.547	0.822						0.629					
COM	0.709	0.837	0.632	0.577	0.555	0.795					0.739	0.698				
TRU	0.864	0.902	0.648	0.599	0.786	0.615	0.805				0.698	0.898	0.781			
PER	0.914	0.946	0.853	0.487	0.523	0.439	0.696	0.924			0.550	0.579	0.540	0.776		
EMP	0.815	0.915	0.844	0.542	0.716	0.516	0.771	0.620	0.918		0.651	0.841	0.675	0.899	0.716	
LEAD	0.867	0.904	0.653	0.486	0.599	0.525	0.639	0.536	0.568	0.808	0.564	0.685	0.669	0.735	0.600	0.674

CR, composite reliability; AVE, average variance extracted; COH, cohesion; COM, communication; TRU, trust; PER, performance; EMP, empowerment; and LEAD, leadership.

TABLE 4 | Results of hypothesis: path coefficients and statistical significance.

Hypothesis	β (Coeff. Path)	t statistic	p-value	Supported
H1 Characteristics of the tasks → communication of the members of the virtual team	0.577	13.842	0.000	Yes***
H2 Leadership in the members of the virtual teams → Trust	0.138	3.209	0.001	Yes***
H3 Cohesion in the members of the virtual teams → Trust	0.366	6.725	0.000	Yes***
H4 Empowerment for the members of the virtual teams → Trust	0.348	7.086	0.000	Yes***
H5 Communication between virtual workers → Trust	0.160	3.741	0.000	Yes***
H6 Trust among virtual workers → Performance of the virtual team	0.684	14.281	0.000	Yes***
H7 Communication between virtual workers → Performance of the virtual team	0.019	0.353	0.724	Not supported

For $n = 500$ subsamples, using t distribution (499) of Students in a single queue.

to assess convergent validity, and stated that an acceptable value for this factor is $AVE \geq 0.50$.

Table 3 shows the element loads, Cronbach's alpha and AVE which were found for the constructs. Values for Cronbach's alpha ranged from 0.914 to 0.709, which is higher than the recommended level of 0.70 and therefore indicates strong internal reliability for the constructs. The composite reliability ranged between 0.946 and 0.837 and the AVE ranged between 0.632 and 0.853, which are higher than the recommended levels. The conditions for convergent validity were therefore met. The discriminant validity was calculated with the square root of the AVE and the cross-loading matrix. For satisfactory discriminant validity, the square root of the AVE of a construct should be greater than the correlation with other constructs (Fornell and Larcker, 1981).

These researchers carried out simulation studies to demonstrate that a lack of discriminant validity is better detected by means of another technique called the heterotrait-monotrait ratio (HTMT), which they had discovered earlier. All the HTMT ratios for each pair of factors was <0.90 .

Results for the Structural Models

The structural model was built from the different relationships between the constructs. The hypotheses for the study were tested by analyzing the relationships between the different constructs in the model to see if they were supported (Chin and Newsted, 1999; Reinartz et al., 2009).

The variance is found from the values for the reflective indicators of the constructs (Barclay et al., 1995; Chin, 2010). This was found numerically by calculating the values of R^2 , which is a measure of the amount of variance for the construct in the

model. The bootstrap method was used to test the hypotheses. The detailed results (path coefficient, β , and t -statistic) are summarized in Table 4 and Figure 3.

The measurements for approximate adjustments of the model (Henseler et al., 2016; Henseler, 2017) are given by the Standardized Root Mean Square Residual (SRMR) value (Hu and Bentler, 1998) which measures the difference between the observed correlation matrix and the implied correlation

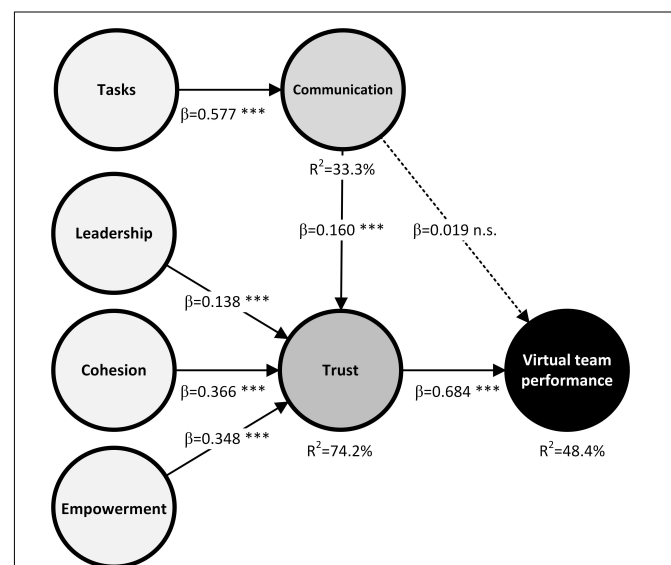
**FIGURE 3 |** Final model. *** $p < 0.001$ [$t(0.001; 499) = 3.106644601$].

TABLE 5 | R^2 results.

Construct	R^2 (%)
Communication (COM)	33.3
Trust (TRU)	74.2
Performance (PER)	48.4

matrix of the model. SRMR shows the average magnitude of these differences.

A low value of SRMR means that the fit is better. In our case SRMR = 0.055, which was within the recommendations for a model with a good fit. A good fit is considered to be shown with a value of SRMR < 0.08 (Hu and Bentler, 1998).

The following conclusions were made from the values for R^2 (see **Table 5** and **Figure 3**) found in the research by Chin (1998) and show that 0.67 = “Substantial,” 0.33 = “Moderate,” and 0.19 = “Weak.” The result obtained for the main dependent variable of the model, Performance (PER) R^2 = 48.4% was moderate and the rest of constructs, Trust R^2 = 74.2% and Communication (COM) R^2 = 33.3%.

This value shows that this model is “substantially” applicable to the performance of virtual teams. Please note that the variables that are not endogenous do not have a value for R^2 .

DISCUSSION

The results obtained for the proposed model have found that the performance of virtual teams is moderately justified by the determinants as R^2 = 48.4%. However, the value obtained for Trust (R^2 = 74.2%) should be noted as it means that the variance of this construct explains to a high percentage, aspects such as the confidence of the virtual team. This is essential to improve the co-creation of software development teams.

This study confirmed that the most significant variable for the performance of the EVT is Trust (H6), since this variable has the strongest influence on the dependent variable Performance. It also has a very high predictive capacity as the determination coefficient is high (β = 0.684; t = 14.281).

These results coincide with other recent findings that confirm that Trust can influence performance by improving member confidence and the subsequent trust (Crisp and Jarvenpaa, 2013). So when everyone's actions are visible, trust was not a key factor in resource allocation (Goh and Wasko, 2012).

The next most important variable in the model is Task features (H1). Virtual teams rely heavily on communication technologies to coordinate their work, so the relationship between the nature of the task and the effectiveness of communication was studied in order to find its subsequent impact on team performance. Therefore, one of the determinants was the characteristics of the tasks and the positive influence on the communication of the members of the virtual team. The result was positive with a confidence level of 99.9%. Therefore, H1 was supported (β = 0.577; t = 13.842). These results amply confirm that great uncertainty about the requirements and the risk planning,

followed by the technological suitability of the projects, are key to communication.

Our study also confirmed that the level of empowerment of the members of the virtual teams was also found to have a significant effect on Trust (H4). This result showed that Empowerment positively promotes and increases the confidence of a virtual team (β = 0.348; t = 7.086).

These results coincide with previous work (Gondal and Khan, 2008) that measured the impact of team empowerment on VT performance and demonstrated that there is a positive relationship between team empowerment and team performance in virtual teams. Our findings go further and state that this is achieved with Trust. As with other studies (Kirkman et al., 2004), empowerment in a virtual team can work as an alternative to leadership. Thus, the activities that are normally done by a team leader can be carried out by the members (Kerr and Jermier, 1978) by contributing with co-creation. This behavior of the team members because of the empowerment of the team members by the leader has a direct and positive relationship with trust. It is considered a confidence-building attribute. In empowerment, commitment is only reached when the team has a shared vision and honest and regular communication with the leader.

The relationship with the next highest confidence level for trust in the virtual teams was H3: the level of cohesion of the members of the virtual teams (β = 0.366; t = 6.725). This finding shows that the ability of the members of a virtual team to get along with each other is critical to the well-being of the group and task performance. These findings are consistent with previous work (Evans and Dion, 1991; Simons and Peterson, 2000; Baltes et al., 2002; Powell et al., 2004; Spector, 2006; Lu, 2015).

Therefore, it will be very important for software development companies to implement intragroup cohesion measures. These findings are consistent with other work (Griffin, 1997). Similarly, managers could implement economic incentives that support their software developers to be strongly involved with the group's tasks. Task cohesion will be greater if members identify with the group's tasks and find them intrinsically rewarding and valuable.

In the current context with the Covid-19 pandemic, this cohesion has been highly questioned. Let's not forget that the isolation measures decreed by many governments have made it difficult to deal with aspects such as different geographical locations, belonging to different organizations, and different sectors of the economy. This has made effective communication and close coordination difficult. However, the results reaffirm the theories already shown (Powell et al., 2004).

One of the factors is the level of leadership of the members of the virtual teams (H2). The results showed that this had a direct and positive influence on Trust (β = 0.138; t = 3.209). Clearly, leadership in VTs is important. The results obtained coincide with the study by Baard et al. (2014) and show that the role of leaders is important for working in a VT, especially because leaders influence the way a team faces obstacles and the way the team ultimately adapts to such challenges, which is very important for the confidence generated for the future.

Therefore, the leader of a virtual team must use a style that generates Trust as a mediating factor in the indirect effect that this has on Performance.

The Communication between virtual workers has a direct and positive influence on the confidence of the virtual team and was supported ($\beta = 0.160$; $t = 3.741$) with a confidence level of 99.9%. Our study does support this hypothesis and agrees with Peñarroja et al. (2013), who found that as virtuality increased, team coordination declined, but this relationship was partially mediated by levels of Trust. In addition, as can be seen in the results, it is the least strongly supported hypothesis.

H7, the level of communication between virtual workers has a direct and positive influence on the performance of the virtual team, was not supported ($\beta = 0.019$; $t = 0.353$). This outcome appears to be conditioned by the very high levels of virtuality that have been reached during the containment measures decreed by governments at the start of the Covid-19 pandemic and, as stated above, clearly demonstrate that communication influences trust only through trust.

This result reaffirms the role of trust-building in achieving the highest performance of the virtual team and allows us to conclude that the confidence of all members in the virtual team is key to success in software development.

CONCLUSION

The proposed model based on the IPO adaptation (Gilson et al., 2015) has been largely validated using a PLS-SEM analysis. Therefore, software companies can use it as a theoretical framework when preparing their human resources and Virtual Teams management policies.

The important role of Trust as a basis for most of the variables of the model shows that it should be considered as one of

the most important and relevant variables, especially because of the increase in virtualization and teleworking during the Covid-19 pandemic. Companies must give greater importance to Trust and take into account that all measures which strengthen leadership, communication, cohesion or the configuration of task characteristics must be designed considering the trust generated. It is interesting to note that economic incentives can help with group cohesion and policies improve empowerment. One such incentive could be skills training for group members. These measures may become more important than leadership in the coming years, given the results found during the pandemic.

Finally, this study was completed with software developers who use agile methodologies and who have good IT skills. The results, therefore, show that the increased virtuality brought about by the pandemic can be an opportunity to innovate in communication to influence performance.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

VG-A undertook the research, collected the data, and prepared the initial manuscript. PP-S completed, revised, and finalized the manuscript, and participated in the preparation of the manuscript. MA-C provided the intellectual input and analyzed the data. All authors contributed to the article and approved the submitted version.

REFERENCES

- Abarca, V. M. G., Palos-Sanchez, P. R., and Rus-Arias, E. (2020). Working in virtual teams: a systematic literature review and a bibliometric analysis. *IEEE Access* 8, 168923–168940. doi: 10.1109/access.2020.3023546
- Alsharo, M., Gregg, D., and Ramirez, R. (2017). Virtual team effectiveness: the role of knowledge sharing and trust. *Inf. Manage.* 54, 479–490. doi: 10.1016/j.im.2016.10.005
- Altschuller, S., and Benbunan-Fich, R. (2010). Trust, performance, and the communication process in ad hoc decision-making virtual teams. *J. Comput. Mediat. Commun.* 16, 27–47. doi: 10.1111/j.1083-6101.2010.01529.x
- Andressen, P., Konradt, U., and Neck, C. P. (2012). The relation between self-leadership and transformational leadership: competing models and the moderating role of virtuality. *J. Leadersh. Organ. Stud.* 19, 68–82. doi: 10.1177/1548051811425047
- Baard, S. K., Rench, T. A., and Kozlowski, S. W. J. (2014). Performance adaptation: a theoretical integration and review. *J. Manage.* 40, 48–99. doi: 10.1177/0149206313488210
- Bagozzi, R. P., and Yi, Y. (1988). On the evaluation of structural equation models. *J. Acad. Mark. Sci.* 16, 74–94.
- Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., and LaGanke, J. S. (2002). Computer-mediated communication and group decision making: a meta-analysis. *Organ. Behav. Hum. Decis. Process.* 87, 156–179. doi: 10.1006/obhd.2001.2961
- Balthazard, P. A., Waldman, D. A., and Warren, J. E. (2009). Predictors of the emergence of transformational leadership in virtual decision teams. *Leadersh. Q.* 20, 651–663. doi: 10.1016/j.leaqua.2009.06.008
- Barclay, D., Higgins, C., and Thompson, R. (1995). The partial least squares (PLS) approach to casual modeling: personal computer adoption and use as an Illustration. *Technol. Stud.* 2, 285–309.
- Bell, M., Robertson, D., Weeks, M., and Yu, D. (2002). A virtual team group process. *Can. J. Nur. Leadersh.* 15, 30–33. doi: 10.12927/cjnl.2002.19157
- Bormann, E. G. (1983). “Symbolic convergence: organizational communication and culture,” in *Communication and Organizations: An Interpretive Approach*, eds L. Putnam, and M. E. Pacanowsky, (Thousand Oaks, CA: SAGE Publications), 99–122.
- Bormann, E. G. (1996). Symbolic convergence theory and communication in group decision making. *Commun. Group Decis. Making* 2, 81–113. doi: 10.4135/9781452243764.n4
- Bormann, E. G., Craan, J. F., and Shields, D. C. (1994). In defense of symbolic convergence theory: a look at the theory and its criticisms after two decades. *Commun. Theory* 4, 259–294. doi: 10.1111/j.1468-2885.1994.tb00093.x
- Bormann, E. G., Knutson, R. L., and Musolf, K. (1997). Why do people share fantasies? An empirical investigation of a basic tenet of the symbolic convergence communication theory. *Commun. Stud.* 48, 254–276. doi: 10.1080/10510979709368504
- Boudreau, M.-C., Gefen, D., and Straub, D. W. (2001). Validation in information systems research: a state-of-the-art assessment. *MIS Q.* 25, 1–16. doi: 10.2307/3250956
- Brahm, T., and Kunze, F. (2012). The role of trust climate in virtual teams. *J. Manage. Psychol.* 27, 595–614. doi: 10.1108/02683941211252446

- Brett, J., Behfar, K., and Kern, M. C. (2006). *Managing Multicultural Teams*. Brighton, MA: Harvard Business Review.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., et al. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 395, 912–920. doi: 10.1016/s0140-6736(20)30460-8
- Bryant, S. M., Albring, S. M., and Murthy, U. (2009). The effects of reward structure, media richness and gender on virtual teams. *Int. J. Account. Inf. Syst.* 10, 190–213. doi: 10.1016/j.accinf.2009.09.002
- Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., and Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *Leadersh. Q.* 17, 288–307. doi: 10.1016/j.leaqua.2006.02.007
- Campion, M. A., Medsker, G. J., and Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: implications for designing effective work groups. *Pers. Psychol.* 46, 823–847. doi: 10.1111/j.1744-6570.1993.tb01571.x
- Chen, C., de Rubens, G. Z., Xu, X., and Li, J. (2020). Coronavirus comes home? Energy use, home energy management, and the social-psychological factors of COVID-19. *Energy Res. Soc. Sci.* 68, 101688. doi: 10.1016/j.erss.2020.101688
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Mod. Methods Bus. Res.* 295, 295–336.
- Chin, W. W. (2010). “How to write up and report PLS analyses,” in *Handbook of Partial Least Squares*, eds H. Wang, J. Henseler, V. E. Vinzi, and W. W. Chin, (Berlin: Springer), 655–690. doi: 10.1007/978-3-540-32827-8_29
- Chin, W. W., and Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. *Stat. Strategies Small Sample Res.* 1, 307–341.
- Coppola, N. W., Hiltz, S. R., and Rotter, N. G. (2004). Building trust in virtual teams. *IEEE Trans. Prof. Commun.* 47, 95–104. doi: 10.1109/TPC.2004.828203
- Cramton, C. D., and Webber, S. S. (2005). Relationships among geographic dispersion, team processes, and effectiveness in software development work teams. *J. Bus. Res.* 58, 758–765. doi: 10.1016/j.jbusres.2003.10.006
- Crisp, C. B., and Jarvenpaa, S. L. (2013). Swift trust in global virtual teams. *J. Pers. Psychol.* 12, 45–56. doi: 10.1027/1866-5888/a000075
- Cummings, J. N., and Haas, M. R. (2012). So many teams, so little time: time allocation matters in geographically dispersed teams. *J. Organ. Behav.* 33, 316–341. doi: 10.1002/job.777
- Daft, R. L., and Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Manage. Sci.* 32, 554–571. doi: 10.1287/mnsc.32.5.554
- Daft, R. L., and Macintosh, N. B. (1981). A tentative exploration into the amount and equivocality of information processing in organizational work units. *Adm. Sci. Q.* 26, 207–224. doi: 10.2307/2392469
- David Strang, K. (2011). Leadership substitutes and personality impact on time and quality in virtual new product development projects. *Proj. Manage. J.* 42, 73–90. doi: 10.1002/pmj.20208
- Dayan, M., and Di Benedetto, C. A. (2010). The impact of structural and contextual factors on trust formation in product development teams. *Ind. Mark. Manage.* 39, 691–703. doi: 10.1016/j.indmarman.2010.01.001
- De Jong, B. A., and Elfring, T. (2010). How does trust affect the performance of ongoing teams? The mediating role of reflexivity, monitoring, and effort. *Acad. Manage. J.* 53, 535–549. doi: 10.5465/amj.2010.51468649
- de Ven, A. H., Delbecq, A. L., and Koenig, R. Jr. (1976). Determinants of coordination modes within organizations. *Am. Soc. Rev.* 41, 322–338. doi: 10.2307/2094477
- Dennis, A. R., and Kinney, S. T. (1998). Testing media richness theory in the new media: the effects of cues, feedback, and task equivocality. *Inf. Syst. Res.* 9, 256–274. doi: 10.1287/isre.9.3.256
- Duarte, D. L., and Snyder, N. T. (2006). *Mastering Virtual Teams: Strategies, Tools, and Techniques that Succeed*. Hoboken, NJ: John Wiley & Sons.
- Dulebohn, J. H., and Hoch, J. E. (2017). Virtual teams in organizations. *Hum. Resour. Manage. Rev.* 27, 569–574. doi: 10.1016/j.hrmr.2016.12.004
- Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Adm. Sci. Q.* 17, 313–327. doi: 10.2307/2392145
- Ebrahim, N. A., Ahmed, S., and Taha, Z. (2009). Virtual teams: a literature review. *Aust. J. Basic Appl. Sci.* 3, 2653–2669.
- Evans, C. R., and Dion, K. L. (1991). Group cohesion and performance: a meta-analysis. *Small Group Res.* 22, 175–186. doi: 10.1177/1046496491222002
- Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312
- Fuller, M. A., Hardin, A. M., and Davison, R. M. (2006). Efficacy in technology-mediated distributed teams. *J. Manage. Inf. Syst.* 23, 209–235. doi: 10.2753/mis0742-1222230308
- Furumo, K. (2009). The impact of conflict and conflict management style on deadbeats and deserters in virtual teams. *J. Comput. Inf. Syst.* 49, 66–73.
- Galbraith, J. R. (1973). *Designing Complex Organizations*. Boston, MA: Addison-Wesley Longman Publishing Co., Inc.
- Garrison, G., Wakefield, R. L., Xu, X., and Kim, S. H. (2010). Globally distributed teams: the effect of diversity on trust, cohesion and individual performance. *ACM SIGMIS Database Database Adv. Inf. Syst.* 41, 27–48. doi: 10.1145/1851175.1851178
- Geber, B. (1995). Virtual teams. *Training* 32, 36–40.
- Gilson, L. L., Maynard, M. T., Young, N. C. J., Vartiainen, M., and Hakonen, M. (2015). Virtual teams research: 10 Years, 10 themes, and 10 opportunities. *J. Manage.* 41, 1313–1337. doi: 10.1177/0149206314559946
- Glückler, J., and Schrott, G. (2007). Leadership and performance in virtual teams: exploring brokerage in electronic communication. *Int. J. E-Collaboration (IJeC)* 3, 31–52. doi: 10.4018/jec.2007070103
- Goh, S., and Wasko, M. (2012). The effects of leader-member exchange on member performance in virtual world teams. *J. Assoc. Inf. Syst.* 13, 861–885. doi: 10.17705/1jais.00308
- Gondal, A. M., and Khan, A. (2008). Impact of team empowerment on team performance: case of the telecommunications industry in Islamabad. *Int. Rev. Bus. Res. Papers* 4, 138–146.
- Griffin, E. (1997). *Groupthink. A First Look at Communication Theory*. New York, NY: McGraw-Hill Education.
- Guzzo, R. A., Yost, P. R., Campbell, R. J., and Shea, G. P. (1993). Potency in groups: articulating a construct. *Br. J. Soc. Psychol.* 32, 87–106. doi: 10.1111/j.2044-8309.1993.tb00987.x
- Hair, J. F., Ringle, C. M., and Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *J. Mark. Theory Pract.* 19, 139–152. doi: 10.2753/mtp1069-6679190202
- Hair, J. F., Ringle, C. M., and Sarstedt, M. (2013). Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance. *Long Range Plan.* 46, 1–12. doi: 10.1016/j.lrp.2013.01.001
- Han, H.-J., Hiltz, S. R., Fjermestad, J., and Wang, Y. (2011). Does medium matter? A comparison of initial meeting modes for virtual teams. *IEEE Trans. Prof. Commun.* 54, 376–391. doi: 10.1109/tpc.2011.2175759
- Henderson, L. S. (2008). The impact of project managers' communication competencies: validation and extension of a research model for virtuality, satisfaction, and productivity on project teams. *Proj. Manage. J.* 39, 48–59. doi: 10.1002/pmj.20044
- Henseler, J. (2017). Bridging design and behavioral research with variance-based structural equation modeling. *J. Adv.* 46, 178–192. doi: 10.1080/00913367.2017.1281780
- Henseler, J., Hubona, G., and Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Ind. Manage. Data Syst.* 116, 2–20. doi: 10.1108/imds-09-2015-0382
- Henttonen, K., and Blomqvist, K. (2005). Managing distance in a global virtual team: the evolution of trust through technology-mediated relational communication. *Strategic Change* 14, 107–119. doi: 10.1002/js.c.714
- Hertel, G., Geister, S., and Konradt, U. (2005). Managing virtual teams: a review of current empirical research. *Hum. Resour. Manage. Rev.* 15, 69–95. doi: 10.1016/j.hrmr.2005.01.002
- Hoch, J. E., and Kozlowski, S. W. J. (2014). Leading virtual teams: hierarchical leadership, structural supports, and shared team leadership. *J. Appl. Psychol.* 99, 390–403. doi: 10.1037/a0030264
- Hogg, M. A. (1987). “Social identity and group cohesiveness,” in *Rediscovering the Social Group: A Self-Categorization Theory*, ed. J. Turner. (New York, NY: Basil Blackwell), 89–116.
- Hogg, M. A., and Tindale, R. S. (2001). *Group Processes*. Malden, MA: Blackwell.

- Hu, L., and Bentler, P. M. (1998). Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. *Psychol. Methods* 3:424. doi: 10.1037/1082-989x.3.4.424
- Huang, R., Kahai, S., and Jestic, R. (2010). The contingent effects of leadership on team collaboration in virtual teams. *Comput. Hum. Behav.* 26, 1098–1110. doi: 10.1016/j.chb.2010.03.014
- Jarrah, M. H., and Sawyer, S. (2013). Social technologies, informal knowledge practices, and the enterprise. *J. Organ. Comput. Electron. Commer.* 23, 110–137. doi: 10.1080/10919392.2013.748613
- Joshi, A., Lazarova, M. B., and Liao, H. (2009). Getting everyone on board: the role of inspirational leadership in geographically dispersed teams. *Organ. Sci.* 20, 240–252. doi: 10.1287/orsc.1080.0383
- Kerr, S., and Jermier, J. M. (1978). Substitutes for leadership: their meaning and measurement. *Organ. Behav. Hum. Perf.* 22, 375–403. doi: 10.1016/0030-5073(78)90023-5
- Kirkman, B. L., Cordery, J. L., Mathieu, J., Rosen, B., and Kukenberger, M. (2013). Global organizational communities of practice: the effects of nationality diversity, psychological safety, and media richness on community performance. *Hum. Relations* 66, 333–362. doi: 10.1177/0018726712464076
- Kirkman, B. L., Rosen, B., Tesluk, P. E., and Gibson, C. B. (2004). The impact of team empowerment on virtual team performance: the moderating role of face-to-face interaction. *Acad. Manage. J.* 47, 175–192. doi: 10.5465/20159571
- Kock, N., and Lynn, G. S. (2012). Electronic media variety and virtual team performance: the mediating role of task complexity coping mechanisms. *IEEE Trans. Prof. Commun.* 55, 325–344. doi: 10.1109/TPC.2012.2208393
- Konradt, U., and Hoch, J. E. (2007). A work roles and leadership functions of managers in virtual teams. *Int. J. E-Collaboration (IJeC)* 3, 16–35. doi: 10.4018/jec.2007040102
- Kort, E. D. (2008). What, after all, is leadership? Leadership and plural action. *Leadersh. Q.* 19, 409–425. doi: 10.1016/j.leaqua.2008.05.003
- Lin, C., Standing, C., and Liu, Y.-C. (2008). A model to develop effective virtual teams. *Decis. Support Syst.* 45, 1031–1045. doi: 10.1016/j.dss.2008.04.002
- Lott, A. J., and Lott, B. E. (1965). Group cohesiveness as interpersonal attraction: a review of relationships with antecedent and consequent variables. *Psychol. Bull.* 64:259. doi: 10.1037/h0022386
- Lowry, P. B., Roberts, T. L., Romano, N. C. Jr., Cheney, P. D., and Hightower, R. T. (2006). The impact of group size and social presence on small-group communication: does computer-mediated communication make a difference? *Small Group Res.* 37, 631–661. doi: 10.1177/1046496406294322
- Lowry, P. B., Zhang, D., Zhou, L., and Fu, X. (2010). Effects of culture, social presence, and group composition on trust in technology-supported decision-making groups. *Inf. Syst. J.* 20, 297–315. doi: 10.1111/j.1365-2575.2009.00334.x
- Lu, L. (2015). Building trust and cohesion in virtual teams: the developmental approach. *J. Organ. Eff. People Perf.* 2, 55–72. doi: 10.1108/JOEPP-11-2014-0068
- Makoul, G., and Curry, R. H. (2007). The value of assessing and addressing communication skills. *Jama* 298, 1057–1059. doi: 10.1001/jama.298.9.1057
- Martínez-Cañas, R., Ruiz-Palomino, P., Linuesa-Langreo, J., and Blázquez-Resino, J. J. (2016). Consumer participation in co-creation: an enlightening model of causes and effects based on ethical values and transcendent motives. *Front. Psychol.* 7:793. doi: 10.3389/fpsyg.2016.00793
- Martins, L. L., Gilson, L. L., and Maynard, M. T. (2004). Virtual teams: what do we know and where do we go from here? *J. Manage.* 30, 805–835. doi: 10.1016/j.jm.2004.05.002
- Maynard, M. T., Mathieu, J. E., Rapp, T. L., and Gilson, L. L. (2012). Something(s) old and something(s) new: modeling drivers of global virtual team effectiveness. *J. Organ. Behav.* 33, 342–365. doi: 10.1002/job.1772
- McBer and Company. (1980). *Trainer's Guide*. Boston, MA: McBer and Company.
- Mohr, L. B. (1971). Organizational technology and organizational structure. *Adm. Sci. Q.* 16, 444–459. doi: 10.2307/2391764
- Montoya-Weiss, M. M., Massey, A. P., and Song, M. (2001). Getting it together: temporal coordination and conflict management in global virtual teams. *Acad. Manage. J.* 44, 1251–1262. doi: 10.2307/3069399
- Palos, P. R., and Correia, M. B. (2017). La actitud de los recursos humanos de las organizaciones ante la complejidad de las aplicaciones SaaS. *Dos Algarves Multidiscip.* J. 28, 87–103. doi: 10.18089/damej.2016.28.1.6
- Palos-Sanchez, P. R. (2017). El cambio de las relaciones con el cliente a través de la adopción de APPS: estudio de las variables de influencia en M-Commerce. *Rev. Espacios* 38:38.
- Peñarroja, V., Orengo, V., Zornoza, A., and Hernández, A. (2013). The effects of virtuality level on task-related collaborative behaviors: the mediating role of team trust. *Comput. Hum. Behav.* 29, 967–974. doi: 10.1016/j.chb.2012.12.020
- Perrow, C. (1967). A framework for the comparative analysis of organizations. *Am. Soc. Rev.* 32, 194–208. doi: 10.2307/2091811
- Piccoli, G., Powell, A., and Ives, B. (2004). Virtual teams: team control structure, work processes, and team effectiveness. *Inf. Technol. People* 17, 359–379. doi: 10.1108/09593840410570258
- Pitagorsky, G. (2007). “Managing virtual teams for high performance,” in *Paper Presented at PMI Global Congress*, (North America, Atlanta, GA: Project Management Institute).
- Powell, A., Piccoli, G., and Ives, B. (2004). Virtual teams: a review of current literature and directions for future research. *SIGMIS Database* 35, 6–36. doi: 10.1145/968464.968467
- Pridmore, J., and Phillips-Wren, G. (2011). Assessing decision making quality in face-to-face teams versus virtual teams in a virtual world. *J. Decis. Syst.* 20, 283–308. doi: 10.3166/jds.20.283-308
- Purvanova, R. K., and Bono, J. E. (2009). Transformational leadership in context: Face-to-face and virtual teams. *Leadersh. Q.* 20, 343–357. doi: 10.1016/j.leaqua.2009.03.004
- Rapp, A., Ahearne, M., Mathieu, J., and Rapp, T. (2010). Managing sales teams in a virtual environment. *Int. J. Res. Mark.* 27, 213–224.
- Rashid, M., and Dar, J. (1994). Current managerial styles & effective managers. *Manage. Serv.* 38, 16–17.
- Reinartz, W., Haenlein, M., and Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *Int. J. Res. Mark.* 26, 332–344. doi: 10.1016/j.ijresmar.2009.08.001
- Ribes-Giner, G., Perelló-Marin, M. R., and Pantoja-Díaz, O. (2017). Revisión sistemática de literatura de las variables clave del proceso de co-creación en las instituciones de educación superior. *Tec. Empre.* 11, 41–53. doi: 10.18845/te.v11i3.3365
- Rico, R., and Cohen, S. G. (2005). Effects of task interdependence and type of communication on performance. *J. Manage. Psychol.* 20, 261–274. doi: 10.1108/02683940510589046
- Saldana Ramos, J. (2010). *VTManager: Un Marco Metodológico Para la Mejora de la Gestión de Los Equipos de Desarrollo Software Global*. Madrid: Universidad Carlos III de Madrid.
- Salisbury, W. D., Carte, T. A., and Chidambaram, L. (2006). Cohesion in virtual teams: validating the perceived cohesion scale in a distributed setting. *SIGMIS Database* 37, 147–155. doi: 10.1145/1161345.1161362
- Sánchez, P. R. P. (2017). Drivers and barriers of the cloud computing in SMEs: the position of the European union. *Harv. Deusto Bus. Res.* 6, 116–132.
- Sarker, S., Sarker, S., and Schneider, C. (2009). Seeing remote team members as leaders: a study of US-Scandinavian teams. *IEEE Trans. Prof. Commun.* 52, 75–94. doi: 10.1109/TPC.2008.2007871
- Schepers, J., de Jong, A., de Ruyter, K., and Wetzels, M. (2011). Fields of gold: perceived efficacy in virtual teams of field service employees. *J. Service Res.* 14, 372–389. doi: 10.1177/1094670511412354
- Schweitzer, L., and Duxbury, L. (2010). Conceptualizing and measuring the virtuality of teams. *Inf. Syst. J.* 20, 267–295. doi: 10.1111/j.1365-2575.2009.00326.x
- Shuffler, M. L., Wiese, C. W., Salas, E., and Burke, C. S. (2010). Leading one another across time and space: exploring shared leadership functions in virtual teams. *Rev. Psicolog Trabajo Las Organ.* 26, 3–17. doi: 10.5093/tr2010v26n1a1
- Simons, T. L., and Peterson, R. S. (2000). Task conflict and relationship conflict in top management teams: the pivotal role of intragroup trust. *J. Appl. Psychol.* 85:102. doi: 10.1037/0021-9010.85.1.102
- Spector, T. (2006). Does the sustainability movement sustain a sustainable design ethic for architecture? *Environ. Ethics* 28, 265–283. doi: 10.5840/enviroethics200628317
- Subramanyam, V. (2013). Team cohesion between national youth and junior volleyball players: a comparative analysis. *Int. J. Sports Sci. Fitness* 3, 250–258.
- Tan, C. K., Ramayah, T., Teoh, A. P., and Cheah, J.-H. (2019). Factors influencing virtual team performance in Malaysia. *Kybernetes* 48, 2065–2092. doi: 10.1108/K-01-2018-0031

- Velicia-Martin, F., Cabrera-Sanchez, J.-P., Gil-Cordero, E., and Palos-Sanchez, P. R. (2021). Researching COVID-19 tracing app acceptance: incorporating theory from the technological acceptance model. *PeerJ Comput. Sci.* 7:e316. doi: 10.7717/peerj-cs.316
- Warkentin, M., and Beranek, P. M. (1999). Training to improve virtual team communication. *Inf. Syst. J.* 9, 271–289. doi: 10.1046/j.1365-2575.1999.00065.x
- Wei, L. H., Thurasamy, R., and Popa, S. (2018). Managing virtual teams for open innovation in Global Business Services industry. *Manage. Decis.* 56, 1285–1305. doi: 10.1108/MD-08-2017-0766
- Werts, C. E., Linn, R. L., and Jöreskog, K. G. (1974). “Quantifying unmeasured variables,” in *Measurement in the Social Sciences*, ed. H. M. Blalock, (Chicago: Aldine Publishing Co), 270–292. doi: 10.4324/9781351329088-11
- Whitford, T., and Moss, S. A. (2009). Transformational leadership in distributed work groups: the moderating role of follower regulatory focus and goal orientation. *Commun. Res.* 36, 810–837. doi: 10.1177/0093650209346800
- Zúñiga Ramirez, C., Solano Cordero, J., and Bolaños Garita, R. (2016). Quantic trends in knowledge-based companies: a case analysis of a Costa Rican experience. *Tec. Empresarial* 10, 29–40. doi: 10.18845/te.v10i3.2938

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Female Micro-Entrepreneurs and Social Networks: Diagnostic Analysis of the Influence of Social-Media Marketing Strategies on Brand Financial Performance

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The business world is facing a very complicated situation due to the COVID-19 pandemic. Small- and medium-sized companies (SMEs)—both in Spain and at the global level—are seeing their survival jeopardized by a fall in revenues. This scenario is aggravated in the case of micro-SMEs headed by female entrepreneurs. Accordingly, micro-SMEs, particularly those led by female entrepreneurs, need to reinvent themselves to overcome the current adversities that could lead to the destruction of their businesses and hence their jobs. One of the ways to do this is to take advantage of digital transformation. Therefore, the aim of this paper is to analyze which variables influence the financial results of female-led Spanish micro-SMEs when they carry out social marketing actions. For that purpose, an online survey was designed and analyzed using the “PROCESS” macro. Results show that social media marketing actions have significant effects on financial performance.

Keywords: women entrepreneurs, micro-SMEs, social media marketing, financial performance, digital transformation

INTRODUCTION

Rates of female entrepreneurship in Spain are higher than in the rest of Europe. According to data provided by the 2019 Global Entrepreneurship Monitor (GEM) World Report, for every 10 start-ups in Spain led by men, there are 9 led by women, while the European average stands at six female entrepreneurs for every 10 male entrepreneurs.

Among the reasons for female entrepreneurship is the need to break through the “glass ceiling,” or the importance of achieving a work-life balance (Moreno-Gavara and Jiménez-Zarco, 2019). However, the desire to start up a business is hindered by the fact that the majority of women entrepreneurs—particularly those who set up a micro-SME or are self-employed—face not only economic difficulties but also an ongoing lack of cultural and social support in our country (Mastercard Index of Women Entrepreneurs, 2019). As a result, many of them start their business in the services sector, intensively using the digital environment (Navarro and Martínez, 2012).

The complicated situation facing Spanish women entrepreneurs is being seriously aggravated by the coronavirus disease of 2019 (COVID-19) crisis. The general fall in demand, together with temporary closures and the restrictions imposed on opening hours and maximum capacity,

translates into a scenario of uncertainty and risk that leads many to fear for the survival of their business (Spanish Confederation of Small and Medium Enterprises, 2020).

Short-term survival becomes the objective (Caldecott, 2020), and driven by a need to modify their business strategy, many micro-entrepreneurs turn their attention to the digital environment in their area of activity (Joseph et al., 2020). The restrictions imposed on economic activity have also affected the general public: online shopping has become widespread and social networks are playing a leading role as a channel that connects companies and consumers (Laguna et al., 2020). As a result, many companies that are totally new to the digital environment are starting to see social media marketing (SMM) as a simple, inexpensive way to raise awareness and make a name for themselves. The digital environment also lowers the cost of sales, by providing companies with a new channel through which to inform, dialog, and interact with their traditional and new customers (Constantinides, 2014).

The social media landscape has revolutionized marketing by giving smaller companies the ability to run efficient marketing campaigns and create brand awareness more effectively. In the past, only large companies could afford major marketing campaigns, but today, every company can have a presence on social media and use it as a tool in their marketing (Coles, 2017).

Given this situation, the present study has a twofold objective. In the first place, it seeks to analyze the effects of social marketing on the financial performance of micro-entrepreneurs. Second, it aims to identify whether the existing relationship is influenced by other variables relating to business strategy or the personal characteristics of the entrepreneur.

To that end, in the following section, we present the literature review and development of the hypotheses. The section “Data and Variables” describes the databases used in our study as well as the variables of our model. The section “Empirical Methods and Results” explains the empirical strategy applied and presents our findings together with additional robustness tests. Finally, the section “Discussion and Conclusion” discusses the main findings and their implications.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Social Media Marketing and Financial Performance

Social networks provide micro-enterprises with a place to carry out their marketing actions. In particular, women-led micro-enterprises have made them the channel through which to inform and interact directly, closely, and interactively with their customers. According to Smith et al. (2015), social media is not only a tool for the exchange of information (Lee et al., 2018), it can also be an influential component of the consumer's decision-making process.

Currently, the design and implementation of marketing actions in social media is a key focus of companies. Constantinides (2014) defines SMM as companies' use of

social media platforms¹ to connect them with their audience in order to achieve different strategic goals such as building brand awareness, increasing sales, or driving website traffic. These actions involve publishing content on their social media profiles, listening to and engaging with their followers, analyzing their results, and running social media advertisements.

SMM has become influential in shaping various aspects of consumer behavior such as awareness, attitudes, and purchasing (Hollebeek and Macky, 2019). These channels have even proven effective in strengthening long-term customer relationships (Smith et al., 2015) by delivering emotional and even epistemic value (Wang and Kim, 2017; Prebensen et al., 2018). Social networks deliver value through the intensive use of audiovisual resources (Teng, 2018). Music and video are used to create ephemeral content, which can be made even more vivid and interactive through the use of augmented reality. All this encourages a more natural flow of interaction, but also creates a sense of enjoyment, pleasure and emotion combined with self-expression (Bayer et al., 2016), generating a hedonic experience that can strongly affect the cognitive/affective/emotional lines of social media users (Braun, 2017).

The COVID-19 pandemic has exponentially increased the creative use of social media, by both people and companies. According to Akram and Kumar (2017) social media are online platforms which people use to build social networks or social relations with other people who share similar personal or career interests, activities, backgrounds, or real-life connections. Currently, social distancing and isolation are increasing the social use of these platforms but can also give people time to use them in emotional way. Social life moves to these networks, making them leisure places where people can meet friends and have informal conversations (Block et al., 2020; Ratten, 2020), as well as engaging in long-forgotten hobbies, neglected passions, and unfulfilled dreams (Banerjee and Rai, 2020).

Hypotheses and Model

In light of the above, we can posit the following hypotheses:

Culnan et al. (2010) and Smith et al. (2015) point out how in the short term there is no direct relationship between the use of social networks and the financial results of companies. Focusing on large North American companies, these studies indicate that increased adoption of social media platforms is not related to differences in financial performance overall. However, they also suggest that in the medium and long terms, there may be a relationship between the use of social media and financial profits. However, studies by Morgan et al. (2009), Shin (2013), and Wang and Kim (2017) show opposite results, finding that SMM is positively associated with financial firm performance for both large firms in industrialized countries and small firms.

According to these ideas, we propose the following:

H1: SMM actions have a direct effect on financial performance.

These effects occur both in the long and short terms. In the long term, SMM is considered to have a positive

¹The major social media platforms are currently Facebook, Instagram, Twitter, LinkedIn, Pinterest, YouTube, and Snapchat.

effect on consumer engagement, resulting in satisfied or loyal customers sharing their positive feelings in interactions with others in their social networks and becoming advocates for the company (Devereux et al., 2020; Nguyen et al., 2020). At a personal level, consumer engagement makes consumers fans of the company, establishing enduring relationships with them, and even encouraging them to proselytize for the company (Hollebeek and Macky, 2019). Moreover, as they become fans of these company's websites, they tend to be more loyal and committed to the company and are more open to receiving information about it (Lee et al., 2018). At social level, engagement makes consumers develop new connections, becoming advocates for the company through interaction with other consumers and even non-customers on their social media networks (Wang and Kim, 2017).

Along with the increase in customer engagement, in the short term, companies strive to attract attention, even the interest of non-customers. Wang and Kim (2017) demonstrate the capacity of SMM to attract attention, and toward the brand (Wang and Kim, 2017), but this is only achieved if the strategic objectives have previously been set correctly.

Many companies set their social marketing objectives in terms of gaining knowledge about their consumers (Cheung et al., 2020). They are established during the first stages of the relationship between the company and customers, and normally seek awareness and name recognition among customers. They are also aimed at gathering information about the customer in order to establish the buyer's personality (Aker et al., 2019). On the other hand, properly defined objectives help to establish the financial indicators on which to base performance measurement and the minimum thresholds from which the result obtained is considered successful (Agostino and Sidorova, 2016).

Thus, we propose the following:

H2: There is a direct relationship between the objectives set and financial performance.

The first phase of SMM plan is the definition of the strategic objectives (Adeola et al., 2020). The company defines them according to market opportunities but also its resources and capacities, and for achievement, there are designed and implement a wide range of SMM.

Today's consumers are more sophisticated, and use social media to search, evaluate, choose, and buy goods and services (Constantinides, 2014). In particular, consumers love for personalized products, but also seek live seeking unique, satisfactory and customized experiences throughout their journey (Bleier et al., 2019). That is the reason because they are keen to get actively involved in the product design, development, and marketing activities (Lin et al., 2018; Zadeh et al., 2019).

Marketers are open to the idea of offering products that can be customized according to the wishes of the final consumer with the aim to increase consumer implication and involvement (Saura et al., 2019). Zadeh et al. (2019) show how companies create, within social platforms, the conditions, means, and tools for consumers to be actively engaged in co-creation processes, both at product design and development, as well as marketing and communication actions aimed to build a strong brand awareness, reputation, or advocacy, among others.

Yadav and Rahman (2017) provide evidence of how the set of SMM actions develops in social networks has important effects on companies' financial results. Awareness is the first objective of companies' SMM strategies. The aim is to ensure that the customer gains a certain level of knowledge about the company/brand that makes them continue looking for information and develop a favorable opinion about it (Langaro et al., 2015).

Brand awareness is increased if customers are frequently exposed to company communications (Makrides et al., 2020). Some SMM actions are specially designed to achieve this objective, such as online advertising, storytelling posts, short videos, and other kinds of actions relating to search engine optimization (Tafesse and Wien, 2018). However, social media can also be used to communicate specific information about the company or to generate and exchange customized company content with the company's existing and potential customers (Bija and Balaş, 2014). Thus, there are some SMM actions developed on digital platforms that are specially designed to capture leads, or generate loyalty and advocacy, which also have a moderating effect on awareness.

According to the last ideas, we propose that:

H3: The marketing objective influences the effect of SMM actions on financial performance.

Education is commonly perceived to be important for the success of entrepreneurial activity (Chhabra and Goyal, 2019). According to Almarhry et al. (2020), education provides the necessary skills and knowledge for an entrepreneur to manage their daily business requirements, design, implement and assess the action developed, and face all the obstacles and challenges that may arise during their entrepreneurial lives (Shepherd et al., 2020).

Many studies recognize the direct relationship between the training received by the entrepreneur and the financial results obtained. Galvão et al. (2018) show that education improves skills, especially in areas such as selection of opportunities, organization of resources to deal with risks, and development of businesses. The ability to detect business opportunities or assess the resources and capabilities of the company are pointed out in the literature as determinants of companies' financial success. Mostafiz et al. (2019) point out how the ability of companies to take advantage of certain market opportunities successfully and immediately depends on the ability of entrepreneurs to identify correct opportunities regarding marketing, resources, raw material supplies, and so forth.

This situation is especially relevant when the entrepreneur has received university training in the area of business, communication, or marketing. Note that business education focuses on three different angles of business management: (1) culture/state of mind, (2) behavior, and (3) creating specific situations (Fayolle et al., 2006; Chhabra and Goyal, 2019). Education focused on business management as a matter of culture/state of mind covers the beliefs, values, and attitudes associated with entrepreneurship (i.e., entrepreneurial identity, spirit, or mindset), while education focused on behavior mostly covers skills such as opportunities, making decisions and developing social skills. Finally, education focused on creating

specific situations concerns the creation of new firms and entrepreneurial situations. But even when the training received is not specifically related to business and management, Galvão et al. (2020) recognize that higher education improves entrepreneurs' ability to recognize business opportunities, stimulating their self-esteem, introspection, knowledge, thereby increasing their ability to act and succeed in a complex environments, and enhancing company performance (Chhabra and Goyal, 2019).

Considering the last ideas, we propose that:

H4: There is a direct and positive relationship between education and financial performance.

The success of the organization depends not only on correctly identifying business opportunities but also on other competences and capacities of the entrepreneur such as: (1) the ability to assess whether the company has the necessary resources and capabilities and (2) the ability to design and implement appropriate strategies to take advantage of favorable business opportunities.

The education received by the entrepreneur is essential in these processes because it promotes values and attitudes such as critical spirit, innovation, and creativity, influencing the success of the decisions made (Fayolle et al., 2006). In addition, when decision-making in an uncertain context, the entrepreneur needs personal skills such as self-esteem, introspection, and knowledge (Galvão et al., 2020), which guarantee the company's continuity and development over time.

Education favors the presence of all the necessary elements in design and strategic planning: knowledge, skills, and attitudes. Decision-making requires knowledge of the context in which to

act, hence the entrepreneur needs information about the market, the customer, and technology, in order to identify the threats and opportunities that they face. However, it also requires the necessary skills and attitudes to be able to assess the situation, as well as to be able to define the objectives to be achieved and design the actions to achieve them.

Even in the absence of any of the above elements, education promotes in the entrepreneur the need to continue learning, either informally or informally (Chhabra and Goyal, 2019). Education helps entrepreneurs to put theory into practice, and it helps them learn to learn; in other words, to pursue and persist in learning, to organize one's own learning, including through effective management of time and information, both individually and in groups (Halberstadt et al., 2019).

Thus, education is believed to moderate each and every one of the processes that are developed in the company (Almarhry et al., 2020; Shepherd et al., 2020). The definition of objectives, the choice of tools to be used, the strategy that is established, and the choice of indicators through which success will be evaluated, are all influenced by the entrepreneur's educational level.

Finally, considering these ideas, we propose that:

H5: Education has a moderating effect on the relationship between the marketing actions carried out and financial performance.

H6: Education has a moderating effect on the relationship between the objectives set and financial performance.

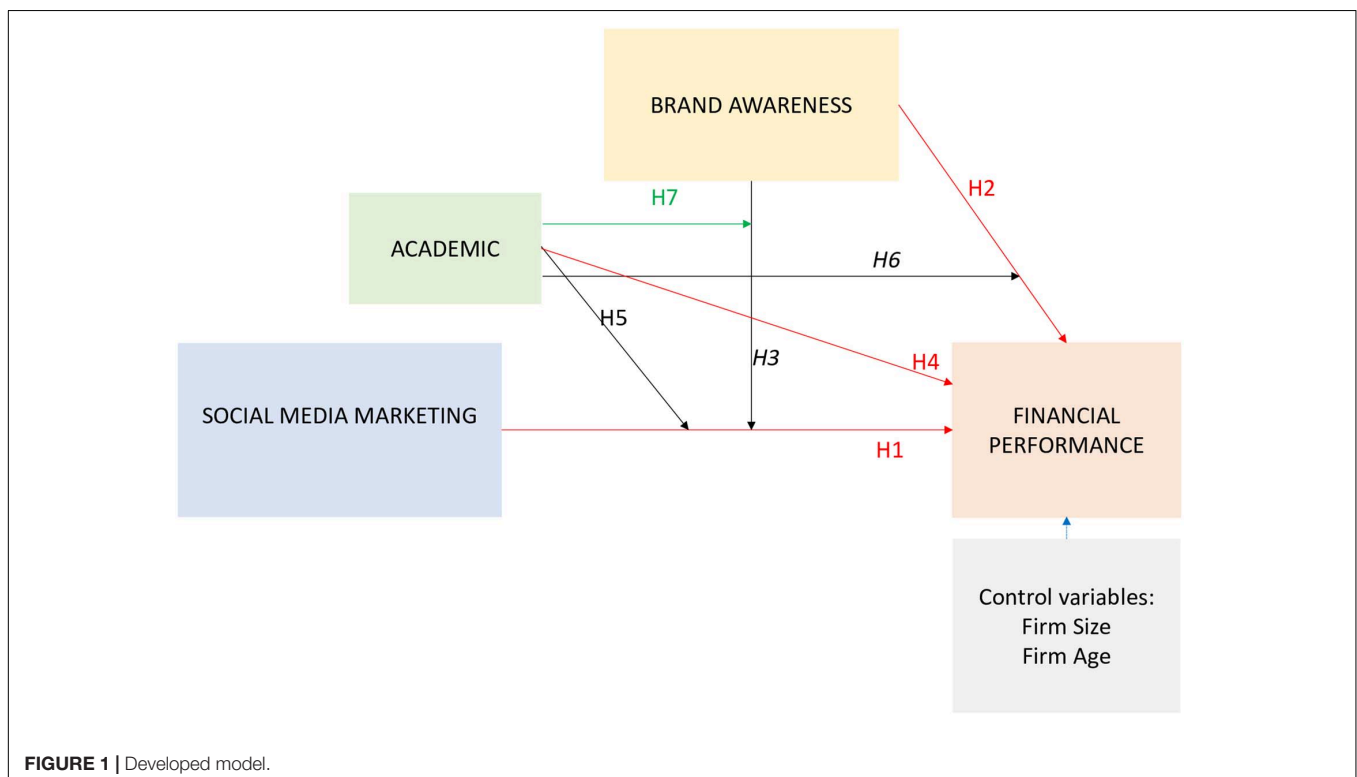


FIGURE 1 | Developed model.

H7: Education has a moderating effect on the influence of the objectives on the relationship between marketing actions carried out and financial performance.

As a summary, **Figure 1** shows the model developed.

DATA AND VARIABLES

Data Analyses

We tested our hypotheses by considering a sample of female entrepreneurs from Spain. More specifically, we analyze a group that belongs to the Spanish Federation of Female Directors, Executives, Professionals, and Entrepreneurs (FEDEPE). FEDEPE has been promoting female leadership since 1987, during which time it has been designated as an organization of public benefit. Furthermore, it has held consultative status in the United Nations Economic and Social Council (ECOSOC) since 2012. Its target is women who are unemployed and want to become entrepreneurs or women who are already developing their project and need professional help to continue growing in their business. Our sample belongs to a particular group whose objective is to train participating female entrepreneurs to gain confidence and employability through the development of their own project or improvement of their digital practices. This program aims to improve the visibility of women in the labor market, facilitating female participation and gender equality in business activity. It also seeks to improve their revenues and thus their business performance through the proper use of digital tools.

To obtain the data used to test our hypotheses, we used online surveys, which were carried out between May and June 2020. The participants filled out a survey consisting of 19 questions relating to their background and profile (age, academic background, experience, use of technologies), their goals, type of digital activities developed, and results. We received 127 survey responses, which, after a verification process of the data, were all found to be valid. This represents a response rate of 40.32% of the sample population (315), which is quite satisfactory (Cohen et al., 2008; Chen and Liang, 2011; Pérez-Luño et al., 2018).

We applied standard procedures for survey-based studies. We tested the potential risk of common-method bias with Harman's one-factor test (Podsakoff et al., 2003). We performed a principal component analysis of all variables in our model. As there was no dominant factor, there is no evidence of common method bias affecting our results (Kerri et al., 2016). In addition, to control for possible non-response bias, we apply the time trend extrapolation test (Armstrong and Overton, 1977) and compare early and late respondents from our survey. This test assumes that late respondents resemble non-respondents. The *t*-test results showed no significant differences in the dependent and independent variables (Camisón and Forés, 2015). Our sample shows similar characteristics in terms of sector of activity, total online sales, percentage of marketing expenses, and experience in social media and digital means (Van Loon et al., 2003).

Variables

This section describes the variables used to test our hypothesis.

Dependent Variable

Financial performance (FIPE)

The dependent variable is constructed from the survey data gathered using specific 5-point Likert-scale questions related to the financial performance achieved by the survey respondents. The construct is the result of an exploratory factor analysis (EFA), and the scale is reliable since Cronbach's alpha is 0.961.

Independent Variables

Social media marketing (SMM)

This variable measures how intensely the company implements SMM actions to achieve results and improve its financial performance. We add and next average the answers from the 5-point Likert-scale questions related to a list of possible social media actions. Cronbach's alpha is 0.91, far above the conventional cut-off value of 0.70.

Brand awareness (AWARENESS)

This variable assesses the goal of the company. In our case, we focus on the goal: to identify and obtain information about the customer (GOAL_INF). Cronbach's alpha is 0.78.

Academic background (ACADEMIC)

This variable captures the academic background of the female entrepreneur. We distinguish between basic studies, secondary education, university studies, postgraduate studies, and doctoral programs.

Control Variables

Our control variables are commonly used in the literature: firm size (SIZE), measured by the number of employees, and firm age (AGE) (Chen et al., 2016; Wang and Kim, 2017; Pérez-Luño et al., 2018).

Descriptive Statistics

Descriptive statistics are shown in **Table 1**. Companies in our sample show an average behavior regarding SMM activities, whereas they depict a clear attitude toward brand awareness. The academic background can be considered a medium-high educational level. The average number of employees is 2.5 with a mean firm age between 5 and 8 years.

As can be seen in **Table 2**, there is no correlation problem in our sample. Additionally, the variance inflation factor (VIF) values indicate there is no multicollinearity.

EMPIRICAL METHODS AND RESULTS

We tested our hypotheses by using the moderation approach, with tests of two-way and three-way interactions and bootstrapping to estimate the confidence intervals for the effects (Hayes, 2013).

This approach is limited by the assumptions of normality, and it is particularly recommended when the hypotheses to test include moderating effects and when parametric

TABLE 1 | Descriptive statistics.

Variables	Obs.	Mean	S.D.	Minimum	Maximum
FIPE	127	0.010	0.959	−1.462	1.761
SMM	127	3.588	1.262	1.000	7.000
AWARENESS	127	5.726	1.343	1.666	7.000
ACADEMIC	127	3.685	0.674	1.000	5.000
SIZE	127	2.535	2.811	0.000	19.000
AGE	127	2.086	1.208	1.000	5.000

Source: Own elaboration.

FIPE, financial performance; SMM, social media marketing; AWARENESS, brand awareness; ACADEMIC, academic background; SIZE, firm age; AGE, firm age.

TABLE 2 | Correlation matrix and variance inflation factors*.

	FIPE	SMM	AWARENESS	ACADEMIC	SIZE	AGE
FIPE	1.000					
SMM	0.600 (0.000)	1.000				
AWARENESS	0.268 (0.002)	0.214 (0.015)	1.000			
ACADEMIC	0.054 (0.543)	−0.056 (0.528)	0.054 (0.546)	1.000		
SIZE	−0.030 (0.731)	−0.022 (0.800)	0.085 (0.341)	0.156 (0.079)	1.000	
AGE	0.041 (0.645)	−0.017 (0.847)	−0.010 (0.905)	0.082 (0.357)	0.371 (0.000)	1.000
VIF		1.03	1.06	1.03	1.19	1.16

*Significance levels in brackets. Source: Own elaboration.

assumptions are not feasible; for example, in small convenience samples (Russell and Dean, 2000; Hayes, 2013; Pérez-Luño et al., 2018). We use the SPSS “PROCESS” macro to apply the abovementioned approach (Hayes, 2013, 2018a) and to test our hypothesized model depicted in **Figure 1**.

The “PROCESS” macro is a widely used computational tool for moderation analysis that produces estimates of all the coefficients in the model and generates bootstrap sampling distributions and interval of confidence for the moderation (two-way interaction) and moderated moderation (three-way interaction) through a resampling process with the bias-corrected bootstrapping technique (5,000 bootstrap samples) (Hayes, 2018b; Wang et al., 2018; Tanner and Su, 2019; Wei et al., 2019).

For our three first hypotheses, which do not involve interactions, we use multiple linear regression analysis. The estimated results are statistically robust, as we tested the assumptions regarding regression analysis (Camisón and Forés, 2015). The mean of the residual is zero. In addition, the Durbin-Watson statistic is 2.023, which allows us to assume that the residuals are zero (as the value is between 1.5 and 2.5). The scatterplot of standardized residuals and standardized predicted values confirms their independence, showing homoscedastic variance (**Supplementary Figure A-1**). The plot of standardized residuals shows that the distribution of the residuals follows the normal probability model (**Supplementary Figure A-2**).

We need to plot the interactions for a better understanding of the two-way and three-way interactions in our model (Laufs et al., 2016; Pérez-Luño et al., 2018). Following Dawson and Richter (2006), we graph the interactions involved in our hypotheses.

Table 3 presents the coefficients of the direct relations, two-way and three-way interactions. These show that the subsequent

addition to the analyzed variables significantly increases the explanatory power of the models, as can be seen by the increase in the *R*-squared values.

In Model I, it can be seen that the SMM actions (SMM) and consumer knowledge together with brand awareness (AWARENESS) show a positive and significant effect, confirming H1 and H2 (coefficients of 0.435, $p = 0.000$ and 0.104, $p = 0.046$, respectively). These results corroborate the idea that the growing adoption of SMM is related to differences in financial performance (Wang and Kim, 2017). It is also confirmed that a clear definition of the company’s goals—more specifically, the mutual awareness and understanding between consumers and company—results in successful financial performance (Agostino and Sidorova, 2016). However, our H4 is not confirmed. Even though the coefficient of ACADEMIC is positive (0.119, $p = 0.245$), it is not significant. While the positive coefficient is in line with the literature (Galvão et al., 2018) showing that as educational level increases, specific skills related to business development improve thereby positively affecting the financial performance of the business; in our sample, it seems that academic background alone does not exert the expected positive effect. This suggests that, when it comes to financial performance, academic background needs the concurrence of additional factors to really exert a positive effect.

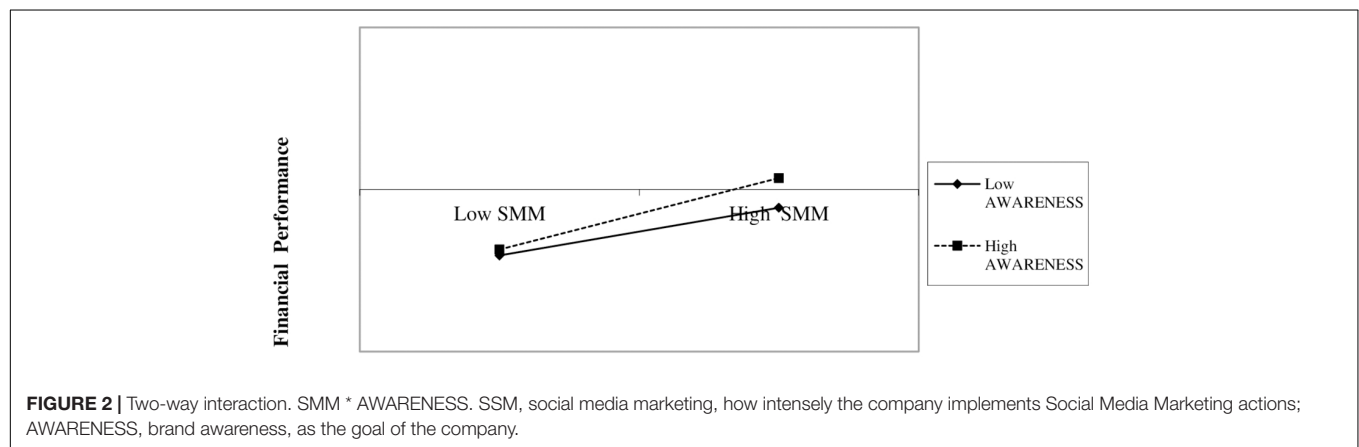
In Model II, we can see that our H3 is confirmed (coefficient 0.065, $p = 0.095$). The business objective determines the SMM actions developed by the company and thus, the effect on its financial performance (Yadav and Rahman, 2017). For a better understanding of this behavior, we plot in **Figure 2** the interaction between SMM and AWARENESS. **Figure 2** shows, in line with H1, the positive effect of SMM on financial performance.

TABLE 3 | Correlation matrix and variance inflation factors*.

Explanatory variables	Model I	Model II	Model III	Model IV	Model V
	H1 H2 H4	H3	H5	H6	H7
SMM	0.435*** (0.055)	0.065 (0.227)	−0.249 (0.291)	0.440*** (0.055)	1.807 (1.040)
AWARENESS	0.104** (0.052)	−0.110 (0.137)	0.122** (0.051)	−0.071 (0.251)	0.962 (0.492)
ACADEMIC	0.119 (0.102)	0.135 (0.101)	−0.479* (0.269)	−0.155 (0.397)	1.099 (0.753)
SMM * AWARENESS		0.065* (0.038)			−0.361 (0.180)
SMM * ACADEMIC			0.182** (0.076)		−0.467 (0.281)
AWARENESS * ACADEMIC				0.048 (0.068)	−0.283** (0.135)
SMM * AWARENESS * ACADEMIC					0.113** (0.048)
AGE	0.056 (0.060)	0.067 (0.060)	0.054 (0.059)	0.059 (0.060)	0.050 (0.059)
SIZE	−0.023 (0.026)	−0.019 (0.026)	−0.024 (0.025)	−0.024 (0.026)	−0.012 (0.025)
Constant	−2.663*** (0.501)	−1.552* (0.826)	−0.487 (1.033)	−1.692 (1.448)	−5.134* (2.674)
Observations	127	127	127	127	127
R-squared (p-value)	0.368	0.455 (0.000)	0.421 (0.000)	0.396 (0.000)	0.455 (0.000)

*Standard errors in brackets.

Superscript asterisks indicate statistical significance at ***0.01, **0.05, and *0.10 levels. Source: Own elaboration.



However, this positive effect is stronger for those companies with greater commitment to improving the company's and the customers' knowledge about one another (AWARENESS) (Bija and Balaş, 2014; Tafesse and Wien, 2018).

Model III confirms H5 (0.182, $p = 0.018$). Academic background moderates all kinds of processes developed in the company (Almarhry et al., 2020; Shepherd et al., 2020). In our model, even though academic background (ACADEMIC) alone is not significant, when it moderates SMM actions, it exerts a positive and significant effect on financial performance. **Figure 3** shows that, in line with H1, SMM has a positive influence on financial performance. Nevertheless, said positive effect is stronger when the female entrepreneur has a higher educational level (Fayolle et al., 2006).

Model IV represents the results of our H6, which cannot be confirmed (0.048, $p = 0.476$). The expected positive moderating effect (Shepherd et al., 2020) of academic background (ACADEMIC) on the influence of better reciprocal knowledge between customers and business (AWARENESS) on financial performance, also stated in H2, exists and is positive but not significant. **Figure 4** shows that, in line with H2, companies

with higher marketing objectives, aimed at obtaining customer information, obtained better financial performance (Aker et al., 2019; Cheung et al., 2020). This positive effect is stronger when the female entrepreneurs have a higher educational level (Galvão et al., 2018). Nevertheless, this moderation is not significant. Again, as in H4, our results indicate that in order to exert a positive and significant influence on financial performance, academic background needs the concurrence of additional factors.

Finally, Model V shows the results of our H7, which is confirmed. The coefficient of the three-way moderation (0.113, $p = 0.021$) indicates that academic background (ACADEMIC) positively moderates the positive effect of AWARENESS on the relationship between SMM and financial performance. **Figure 5** helps to gain a better understanding of our three-way interaction (Pérez-Luño et al., 2018). In line with H3, and regardless of academic background (ACADEMIC), companies with a higher level of SMM activities (Wang and Kim, 2017) and clear business objective—in our case, higher commitment to customer-company reciprocal knowledge (AWARENESS) (Tafesse and Wien, 2018)—show better financial performance.

Financial Performance

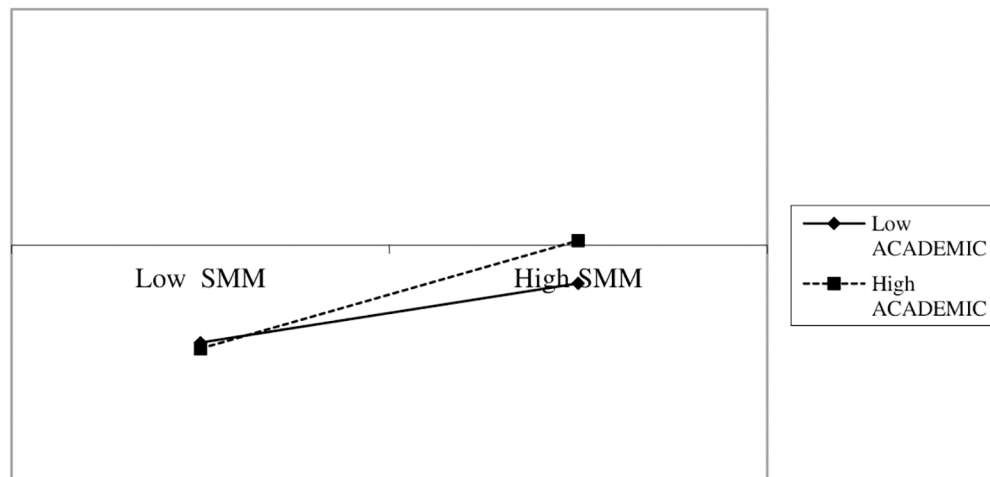


FIGURE 3 | Two-way interaction. SMM * ACADEMIC. SSM, social media marketing, how intensely the company implements Social Media Marketing actions; ACADEMIC, academic background of the female entrepreneur.

Financial Performance

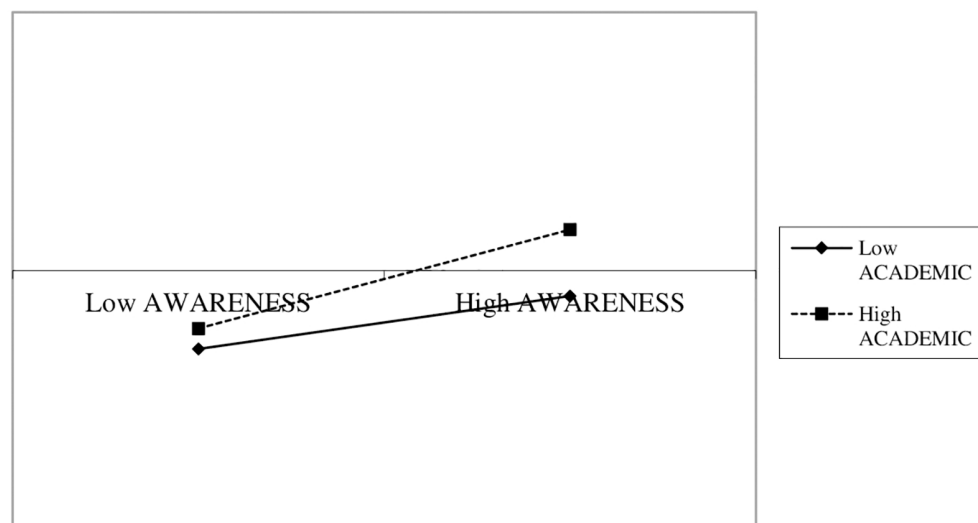


FIGURE 4 | Two-way interaction. AWARENESS * ACADEMIC. AWARENESS, brand awareness, as the goal of the company; ACADEMIC, academic background of the female entrepreneur.

However, said positive effect is stronger when the female entrepreneur has a high educational level, confirming the positive and significant effect of ACADEMIC (Fayolle et al., 2006; Galvão et al., 2018).

DISCUSSION AND CONCLUSION

According to the results obtained through the analysis carried out by means of the “PROCESS” macro, most of the hypotheses raised at the theoretical level are confirmed. This indicates that the use of SMM actions generates a positive effect on the financial results obtained by the female entrepreneurs.

In particular, these results are observed in the increase in the percentage of sales corresponding to purchases through digital means made by current customers, who had already bought offline before, as well as by new customers, who have got to know the company thanks to the use of the social media.

Thus, on the one hand, the use of social media helps keep the brand in the minds of traditional customers and may even help boost brand recognition. This is fundamental in the current pandemic situation in which companies have been forced to stop their professional activity on a physical level. On the other hand, carrying out such actions also allows companies to establish a first contact with new customer, fostering recognition, and even in the short term securing a first purchase. This is especially relevant

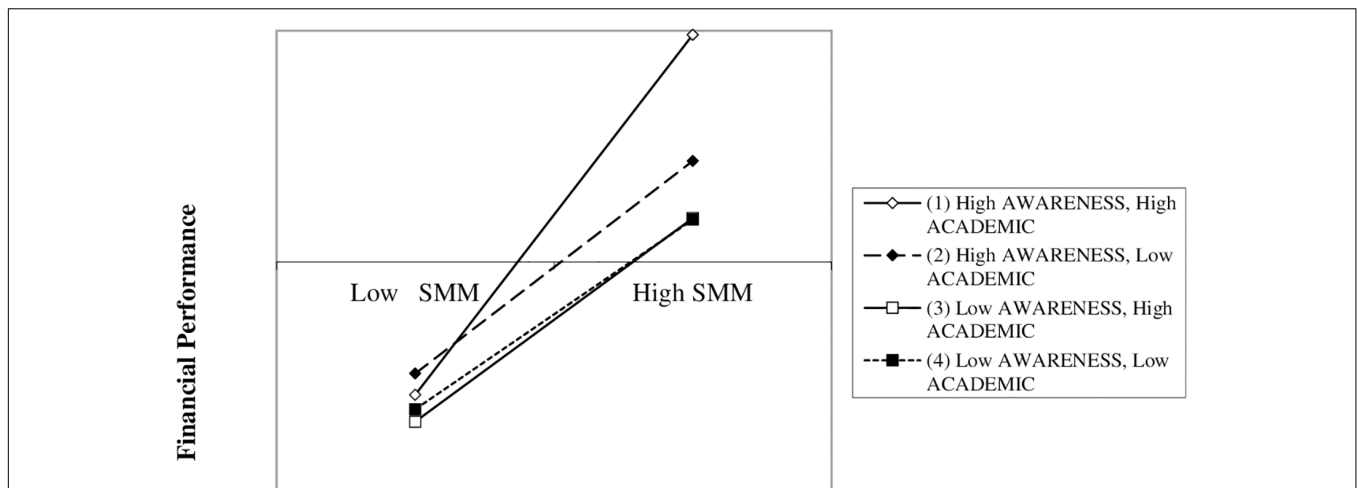


FIGURE 5 | Three-way interaction. SMM * AWARENESS * ACADEMIC. AWARENESS, brand awareness, as the goal of the company; ACADEMIC, academic background of the female entrepreneur; SSM, social media marketing, how intensely the company implements Social Media Marketing actions.

because many of these new customers may be from different geographical areas, so not only can the company increase its local sales but it can also reach more distant geographical areas, thus achieving a better regional or national positioning.

Of these two types of customers, it is worth highlighting the figure of the conventional customer, because it is this one that in the very short term has contributed significantly to the increase in sales. This is due to the fact that a substantial portion of the marketing actions carried out by female-led micro-enterprises have been *via* channels such as e-mail and WhatsApp, or female entrepreneurs may have even used their personal Facebook accounts to make themselves known. In addition, a large share of the female entrepreneurs recognize that having a database on their customers is a very useful source of information for the design of commercial actions directed at customers.

An important element to highlight is how the female entrepreneur's level of education moderates the direct effect of SMM actions on the results obtained, as well as the influence that the objectives established in the strategy have on the latter relationship. It should be noted that a large share of the female entrepreneurs have a high level of education; this means that they have soft skills such as critical thinking and communication skills, which are essential for decision-making, setting objectives to achieve, and the design of actions.

Also, they have other social skills required to identify their target as well as the customer's needs and expectations. Some of the female entrepreneurs may well have completed specialized studies in the field of business management, reinforcing the abovementioned competences. They would thus have the necessary knowledge for the development of efficient actions in the field of marketing and communications.

These conclusions should be taken with some caution since the study carried out has certain limitations. These include the small size of the sample and the bias toward the profile of the female entrepreneur: relatively young and with a high educational level. This fact encourages us to conduct further research to

analyze the existence of differences between different business profiles, in terms of educational level, age, or the sector where they carry out their professional activity.

Furthermore, it would also be interesting to analyze the effects that SMM actions have on other performance indicators other than financial ones, such as those related to organizational processes, or to customer relationships and the construction of a social capital. In fact, the latter are very relevant in companies run by women; in this case, obtaining non-financial results constitutes a differential feature. The use of SMM favors the achievement of this type of results since it encourages the building of relationships between the customer and the brand based on affective and experiential elements.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

AJ-Z was expert in social media marketing. JC-A has been carried out the methodology. JA-J was expert in business management and in entrepreneurship. IG-G was expert in business management, TIC, and finances. All authors contributed to the article and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.630058/full#supplementary-material>

REFERENCES

- Adeola, O., Hinson, R. E., and Evans, O. (2020). "Social media in marketing communications: a synthesis of successful strategies for the digital generation," in *Digital Transformation in Business and Society*, (Cham: Palgrave Macmillan), 61–81.
- Agostino, D., and Sidorova, Y. (2016). A performance measurement system to quantify the contribution of social media: new requirements for metrics and methods. *Measur. Bus. Excel.* 20, 38–51. doi: 10.1108/mbe-05-2015-0030
- Aker, A., Sliwa, A., Dalvi, F., and Bontcheva, K. (2019). Rumour verification through recurring information and an inner-attention mechanism. *Online Soc. Netw. Media* 13:100045. doi: 10.1016/j.osnem.2019.07.001
- Akram, W., and Kumar, R. (2017). A study on positive and negative effects of social media on society. *Int. J. Comput. Sci. Eng.* 5, 351–354. doi: 10.26438/ijcse/v5i10.351354
- Almarhy, F. F., Sarea, A. M., Hamdan, A. M., and Al Mubarak M. S. S. (2020). "The impact of entrepreneurship education on entrepreneurs' skills," in *Entrepreneurial Innovation and Economic Development in Dubai and Comparisons to Its Sister Cities*, ed. Semantic Scholar. doi: 10.4018/978-1-5225-9377-5.ch009
- Armstrong, J., and Overton, T. (1977). Estimating nonresponse bias in mail surveys. *J. Mark. Res.* 14, 396–402. doi: 10.2307/3150783
- Banerjee, D., and Rai, M. (2020). Social isolation in Covid-19: the impact of loneliness. *Int. J. Soc. Psychiatry* 66, 525–527. doi: 10.1177/0020764020922269
- Bayer, J. B., Ellison, N. B., Schoenebeck, S. Y., and Falk, E. B. (2016). Sharing the small moments: ephemeral social interaction on Snapchat. *Inform. Commun. Soc.* 19, 956–977. doi: 10.1080/1369118x.2015.1084349
- Bija, M., and Balaş, R. (2014). Social media marketing to increase brand awareness. *J. Econom. Bus. Res.* 20, 155–164.
- Bleier, A., Harmeling, C. M., and Palmatier, R. W. (2019). Creating effective online customer experiences. *J. Mark.* 83, 98–119. doi: 10.1177/0022242918809930
- Block, P., Hoffman, M., Raabe, I. J., Dowd, J. B., Rahal, C., Kashyap, R., et al. (2020). Social network-based distancing strategies to flatten the COVID-19 curve in a post-lockdown world. *Nat. Hum. Behav.* 4, 588–596. doi: 10.1038/s41562-020-0898-6
- Braun, J. (2017). Being present: toward a better understanding of customer experiences. *Q. Consum. Res.* 14, 207–225. doi: 10.1108/s1548-643520170000014013
- Caldecott, B. (2020). Defining transition finance and embedding it in the post-Covid-19 recovery. *J. Sust. Fin. Invest.* 1–5. doi: 10.1080/20430795.2020.1813478
- Camisón, C., and Forés, B. (2015). Is tourism firm competitiveness driven by different internal or external specific factors: new empirical evidence from Spain. *Tour. Manag.* 48, 477–499. doi: 10.1016/j.tourman.2015.01.001
- Chen, D. N., and Liang, T. P. (2011). Knowledge evolution strategies and organizational performance: a strategic fit analysis. *Electron. Comm. Res. Appl.* 10, 75–84. doi: 10.1016/j.elerap.2010.10.004
- Chen, Y.-Y. K., Jaw, Y.-L., and Wu, B.-L. (2016). Effect of digital transformation on organisational performance of SMEs: evidence from the Taiwanese textile industry's web portal. *Int. Res.* 26, 186–212. doi: 10.1108/intr-12-2013-0265
- Cheung, M. L., Pires, G., and Rosenberger, P. J. (2020). The influence of perceived social media marketing elements on consumer-brand engagement and brand knowledge. *Asia Pac. J. Mark. Logist.*
- Chhabra, M., and Goyal, A. P. (2019). Education & entrepreneurial experience W.R.T. female entrepreneurs. *Int. J. Res. Hum. Arts Literat.* 7, 95–110.
- Cohen, S., Thiraios, D., and Kandilorou, M. (2008). Performance parameters interrelations from a balanced scorecard perspective. *Manag. Audit. J.* 23, 485–503. doi: 10.1108/02686900810875307
- Coles, L. (2017). *Social Media for Business: Foolproof Tips to Help You Promote Your Business or Your Brand*. Hoboken, NJ: John Wiley & Sons.
- Constantinides, E. (2014). Foundations of social media marketing. *Proc. Soc. Behav. Sci.* 148, 40–57. doi: 10.1016/j.sbspro.2014.07.016
- Culnan, M. J., McHugh, P. J., and Zubillaga, J. I. (2010). How large US companies can use Twitter and other social media to gain business value. *MIS Q. Execut.* 9, 243–259.
- Dawson, J. F., and Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: development and application of a slope difference test. *J. Appl. Psychol.* 91, 917–926. doi: 10.1037/0021-9010.91.4.917
- Devereux, E., Grimmer, L., and Grimmer, M. (2020). Consumer engagement on social media: evidence from small retailers. *J. Cons. Behav.* 19, 151–159. doi: 10.1002/cb.1800
- Fayolle, A., Gailly, B., and Lassas-Clerc, N. (2006). Assessing the impact of entrepreneurship education programmes: a new methodology. *J. Eur. Indust. Train.* 30, 701–720. doi: 10.1108/03090590610715022
- Galvão, A., Ferreira, J. J., and Marques, C. (2018). Entrepreneurship education and training as facilitators of regional development. *J. Small Bus. Enter. Dev.* 25, 17–40. doi: 10.1108/jsbed-05-2017-0178
- Galvão, A., Marques, C., and Ferreira, J. J. (2020). The role of entrepreneurship education and training programmes in advancing entrepreneurial skills and new ventures. *Eur. J. Train. Dev.* 44, 595–614. doi: 10.1108/ejtd-10-2019-0174
- Halberstadt, J., Schank, C., Euler, M., and Harms, R. (2019). Learning sustainability entrepreneurship by doing: providing a lecturer-oriented service learning framework. *Sustainability* 11:1217. doi: 10.3390/su11051217
- Hayes, A. F. (2013). *Introduction to Mediation, Moderation and Conditional Process Analysis*. New York, NY: The Guilford Press.
- Hayes, A. F. (2018a). Partial, conditional, and moderated mediation: quantification, inference, and interpretation. *Commun. Monogr.* 85, 4–40. doi: 10.1080/03637751.2017.1352100
- Hayes, A. F. (2018b). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Perspective*, 2nd Edn. New York, NY: The Guilford Press.
- Hollebeek, L. D., and Macky, K. (2019). Digital content marketing's role in fostering consumer engagement, trust, and value: framework, fundamental propositions, and implications. *J. Interact. Mark.* 45, 27–41. doi: 10.1016/j.intmar.2018.07.003
- Joseph, O. P., Tulung, J. E., and Wangke, S. (2020). Impact of social media marketing toward business performance of Mseds in Manado during Covid19-Pandemic. *J. EMBA Riset Ekon. Manaj. Bisnis Akuntansi* 8, 596–605.
- Kerri, Y., Jaw, Y., and Wu, B. (2016). Effect of digital transformation on organisational performance of SMES. *Int. Res.* 26, 186–212.
- Laguna, L., Fiszman, S., Puerta, P., Chaya, C., and Tárrega, A. (2020). The impact of COVID-19 lockdown on food priorities. Results from a preliminary study using social media and an online survey with Spanish consumers. *Food Q. Prefer.* 86:104028. doi: 10.1016/j.foodqual.2020.104028
- Langaro, D., Rita, P., and de Fátima Salgueiro, M. (2015). Do social networking sites contribute for building brands? Evaluating the impact of users' participation on brand awareness and brand attitude. *J. Mark. Commun.* 24, 146–168. doi: 10.1080/13527266.2015.1036100
- Laufs, K., Bembom, M., and Schwens, C. (2016). CEO characteristics and SME foreign market entry mode choice: the moderating effect of firm's geographic experience and host-country political risk. *Int. Mark. Rev.* 33, 246–275. doi: 10.1108/imr-08-2014-0288
- Lee, Y. J., Yoon, H. J., and O'Donnell, N. H. (2018). The effects of information cues on perceived legitimacy of companies that promote corporate social responsibility initiatives on social networking sites. *J. Bus. Res.* 83, 202–214. doi: 10.1016/j.jbusres.2017.09.039
- Lin, M. H. J., Cross, S. N., Jones, W. J., and Childers, T. L. (2018). Applying EEG in consumer neuroscience. *Eur. J. Mark.* 52. doi: 10.1108/EJM-12-2016-0805
- Makrides, A., Vrontis, D., and Christofi, M. (2020). The gold rush of digital marketing: assessing prospects of building brand awareness overseas. *Bus. Perspect. Res.* 8, 4–20. doi: 10.1177/2278533719860016
- Mastercard Index of Women Entrepreneurs (2019). Available online at: <https://newsroom.mastercard.com/wp-content/uploads/2019/12/Mastercard-Index-of-Women-Entrepreneurs-2019.pdf>
- Moreno-Gavara, C., and Jiménez-Zarco, A. I. (eds). (2019). *Sustainable Fashion: Empowering African Women Entrepreneurs in the Fashion Industry*. Berlin: Springer.
- Morgan, N. A., Vorhies, D. W., and Mason, C. H. (2009). Market orientation, marketing capabilities, and firm performance. *Strat. Manag. J.* 30, 909–920. doi: 10.1002/smj.764
- Mostafiz, M. I., Sambasivan, M., and Goh, S. K. (2019). Impacts of dynamic managerial capability and international opportunity identification on firm performance. *Multinatl. Bus. Rev.* 27.

- Navarro, J. R., and Martínez, A. C. (2012). Mujer y desafío emprendedor en España: características y determinantes. *Econ. Indust.* 383, 13–22.
- Nguyen, C., Nguyen, N., and Duong, A. (2020). The relationships of social media marketing, consumer engagement and purchase intention. *Test Eng. Manag.* 2, 24653–24666.
- Pérez-Luño, A., Bojica, A., and Golapakrishnan, S. (2018). The role of cross-functional integration, knowledge complexity and product innovation in firm performance. *Int. J. Operat. Product. Manag.* 39, 94–115. doi: 10.1108/ijopm-04-2017-0251
- Podsakoff, P. M., MacKenzie, S. B., and Lee, J.-Y. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879
- Prebensen, N. K., Chen, J. S., and Uysal, M. (Eds.). (2018). *Creating Experience Value in Tourism*. Cabi.
- Ratten, V. (2020). Coronavirus (covid-19) and social value co-creation. *Int. J. Sociol. Soc. Policy* doi: 10.1108/IJSSP-06-2020-0237
- Russell, C. J., and Dean, M. A. (2000). To log or not to log: bootstrap as an alternative to parametric estimation of moderation effects in the presence of skewed dependent variables". *Organ. Res. Methods* 3, 167–185.
- Saura, J. R., Palos-Sanchez, P. R., and Correia, M. B. (2019). "Digital marketing strategies based on the e-business model: literature review and future directions," in *Organizational Transformation and Managing Innovation in the Fourth Industrial Revolution*, (Philadelphia, PA: IGI Global), 86–103. doi: 10.4018/978-1-5225-7074-5.ch005
- Shepherd, D. A., Saade, F. P., and Wincent, J. (2020). How to circumvent adversity? Refugee-entrepreneurs' resilience in the face of substantial and persistent adversity. *J. Bus. Ventur.* 35:105940. doi: 10.1016/j.jbusvent.2019.06.001
- Shin, S. (2013). The influences of market information management and marketing control in small-sized firms in Korea. *Int. Bus. Res.* 6:52.
- Smith, K. T., Blazovich, J., and Smith, L. M. (2015). Social media adoption by corporations: an examination by platform, industry, size, and financial performance. *Acad. Mark. Stud. J.* 19, 127–143.
- Spanish Confederation of Small and Medium Enterprises (2020). Available online at: <https://www.eurofound.europa.eu/publications>
- Tafesse, W., and Wien, A. (2018). Implementing social media marketing strategically: an empirical assessment. *J. Mark. Manag.* 34, 732–749. doi: 10.1080/0267257x.2018.1482365
- Tanner, E. C., and Su, L. (2019). Reducing perceived vulnerability to increase utilization of nonprofit services. *J. Serv. Mark.* 33, 344–355. doi: 10.1108/jsm-12-2017-0434
- Teng, C. I. (2018). Look to the future: enhancing online gamer loyalty from the perspective of the theory of consumption values. *Decis. Sup. Syst.* 114, 49–60. doi: 10.1016/j.dss.2018.08.007
- Van Loon, A., Tijhuis, M., Picavet, H., Surtees, P., and Ormel, J. (2003). Survey non-response in the Netherlands: effects of prevalence estimates and associations. *Ann. Epidemiol.* 113, 105–110. doi: 10.1016/s1047-2797(02)00257-0
- Wang, Q., Bowling, N. A., Tian, Q., Alarcon, G. M., and Kwan, H. K. (2018). Workplace harassment intensity and revenge: mediation and moderation effects. *J. Bus. Ethics* 151, 213–234. doi: 10.1007/s10551-016-3243-2
- Wang, Z., and Kim, H. G. (2017). Can social media marketing improve customer relationship capabilities and firm performance? Dynamic capability perspective. *J. Interact. Mark.* 39, 15–26. doi: 10.1016/j.intmar.2017.02.004
- Wei, W., Qi, R., and Zhang, L. (2019). Effects of virtual reality on theme park visitors' experience and behaviors: a presence perspective. *Tour. Manag.* 71, 282–293. doi: 10.1016/j.tourman.2018.10.024
- Yadav, M., and Rahman, Z. (2017). Measuring consumer perception of social media marketing activities in e-commerce industry: scale development & validation. *Telemat. Inform.* 34, 1294–1307. doi: 10.1016/j.tele.2017.06.001
- Zadeh, A. H., Zolfagharian, M., and Hofacker, C. F. (2019). Customer–customer value co-creation in social media: conceptualization and antecedents. *J. Strat. Mark.* 27, 283–302. doi: 10.1080/0965254x.2017.1344289

Conflict of Interest: JA-J was employed by company BLC Group.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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