

IT-based strategy, capabilities, and practices: Crowdsourcing implementation in market-oriented firms

Abstract

In this paper, the resource-based view is used to analyze the implementation of crowdsourcing as an IT-based practice. The study examines the strategic positioning in market orientation and the role of two capabilities, transformational leadership and organizational learning capability, in the implementation of crowdsourcing. An empirical study of Spanish telecommunications and biotechnology companies confirms the moderating effect of these capabilities on the relationship between market orientation and crowdsourcing.

Keywords: Crowdsourcing, market orientation, resource-based view, transformational leadership, organizational learning capability

Introduction

Crowdsourcing is an information technology (IT)-based decision support tool that can help organizations obtain market information, enhance market-oriented predictions (Lang, Bharadwaj, & Di Benedetto, 2016), and foster product innovation. In marketing, the main objective of crowdsourcing is to leverage the private knowledge of individuals. This is a new model of knowledge acquisition and innovation for businesses (Bouncken, Roig-Tierno & Kraus, 2019).

As a marketing tool, crowdsourcing can be immensely powerful and can positively affect organizational performance (Devece, Palacios-Marqués, & Llopis-Albert, 2017). The novelty and outcomes of crowdsourcing justify practitioners' and researchers' growing interest in the potential of this practice and the best way to implement it (Qin, Van Der Velde, Chatzakis, McStea, & Smith, 2016). The principal research on crowdsourcing focuses on how to motivate consumers and experts and secure their participation through technology platforms. However, studies of the internal organizational factors needed to implement crowdsourcing and take full advantage of this powerful tool are scarce. This study focuses on the organizational factors that determine the successful implementation of crowdsourcing as a marketing practice.

Crowdsourcing occurs at the intersection of relevant dynamic capabilities in market intelligence regarding new product development, pricing, and strategic decision-making (Vorhies & Morgan, 2005). At the same time, as an organizational practice, crowdsourcing must be guided by the organization's general strategic stance regarding marketing.

Crowdsourcing is rooted in the development and organizational integration of technology platforms. This IT-based view of crowdsourcing also provides a solid theoretical framework for its study. Research in management information systems widely

recognizes the importance of culture, organizational structure, routines, collective mind, and commitment to organizational objectives for the implementation of information systems to obtain expected benefits. Although this influence has been approached from different theories, in the last decade, an increasing number of studies have drawn on the resource-based view (RBV; Devece, Palacios, & Martínez-Simarro, 2017; Liang, You, & Liu, 2010).

In this paper, we present empirical evidence to support our assertion that crowdsourcing implementation depends heavily on the strategic stance of the organization regarding marketing and on the managers' leadership. The study also addresses the complementary nature of dynamic capabilities such as organizational learning capability when combined with crowdsourcing practices.

The paper is structured as follows. First, the theoretical background of the research is presented, and crowdsourcing is defined as an IT-based marketing practice. Drawing on the RBV, we analyze the key organizational capabilities and competencies that support successful crowdsourcing implementation and the role of market orientation as a strategic principle. In this section, we also outline our hypotheses. Afterwards, the study's method and the results of the statistical analysis are presented. The hypotheses are tested using partial least squares structural equation modeling (PLS-SEM) based on data from a survey of general managers of 221 Spanish biotech and telecom companies. The measurement scales used in the empirical study are assessed, and the hypotheses are tested. We conclude with a discussion of our findings, their implications for future research, and the limitations of the study.

Theoretical background

Crowdsourcing practices are used to collect and process information and contributions from individuals who are external to the organization to predict uncertain future outcomes, design solutions, solve problems, or carry out tasks (Lang et al., 2016; Surowiecki, 2005). There is value in applying crowdsourcing to product and service innovations (Devece, Llopis-Albert, & Palacios, 2017), but the literature sheds little light on the key organizational factors that enable successful implementation. Crowdsourcing is based on technology platforms, and the discussion can be approached in terms of the implementation of IT to support specific processes. This approach is consistent with the contingent approach and suggests that there is a need to consider other variables that may mediate or moderate the implementation of IT-based initiatives as well as the organizational capabilities that complement IT integration (Devece, Palacios, & Martínez-Simarro, 2017). This research responds to Piccoli and Ives's (2005) call for studies on the value of IT using "individual strategic initiatives" as the unit of analysis, although studies along these lines have rarely been performed (Doherty & Terry, 2009).

Crowdsourcing can be defined as a set of initiatives based on participatory processes that trespass organizational boundaries (Brabham, 2008). Crowdsourcing is applied to different organizational activities such as crowd voting, microtasking, and generating ideas and solutions (Prpić, Shukla, Kietzmann, & McCarthy, 2015). Crowdsourcing applications pool the judgment of large numbers of people across and outside the firm, offering a powerful practice for superior market prediction (Lang et al., 2016). Despite the value of crowdsourcing, few studies have examined the organizational aspects that are central to crowd-level engagement (Palacios-Marques, Devece-Carañana, & Llopis-Albert, 2016).

Numerous authors have highlighted organizational factors as essential for the effective implementation of IT (Wade & Hulland, 2004). Bruque, Vargas, and Hernández

(2003) established two groups of complementary capabilities to effectively implement IT-based systems: elements related to the human factor and capabilities related to business management. Elements related to the human factor in the organization include a frank and receptive organizational climate, fluid communications, senior managers' leadership, low organizational conflict, organizational flexibility, and the business knowledge of technical staff. Resources related to business management techniques include the use of interdepartmental work teams, training in new technologies, and joint planning of the business and technology strategy.

Aligning IT with company strategy has consistently been considered one of the most important issues facing managers in the implementation of IT initiatives. Since Strassmann's (1997, p. 4) research, scholars have repeatedly affirmed that the consequences of individual IT projects must be clearly linked to company planning if the company wants IT investment to have some possibility of becoming a catalyst for organizational change instead of just an expense. This persistent interest in strategic alignment is because researchers consider a lack of alignment one of the factors that prevent fulfillment of the expected value of IT investments (Martinez-Simarro, Devece, & Llopis-Albert, 2015).

Strategy and crowdsourcing

According to Galliers (2006, p. 227), the dynamic nature of the competitive, collaborative, and regulatory environments in which organizations act sets the firm's strategy toward continuous change in information needs. In product and service innovation, the concept of market orientation is a central element of strategy.

Market orientation is one of the key concepts in the strategy and marketing literature (Hagen, Zucchella, Larimo, & Dimitratos, 2017; Solano-Acosta, Herrero-Crespo, & Collado-Agudo, 2018). It is considered to be the organizational culture that

most effectively and efficiently creates the necessary behaviors to create superior value for buyers (Narver & Slater, 1990). Market orientation establishes organizational principles within a firm so that the firm can continuously offer superior value to customers (Slater and Narver, 1994). Other authors interpret market orientation as an information-based process with three elements: market intelligence, dissemination of information, and response to the market (Kohli & Jaworski, 1990). According to the RBV, market orientation is a set of principles that is focused on understanding the current market and that is crucial not only to the long-term prospects of an organization but also to its capability to keep up with changes in the external marketplace (Bhattarai, Kwong, & Tasavori, 2019).

In our study, we consider that the effect of strategy on crowdsourcing can be estimated by market orientation. Co-creation is a basic feature of crowdsourcing that favors market intelligence and market response (Djelassi & Decoopman, 2013). Organizations with a high market orientation are more conscious of the value of crowdsourcing and have a greater willingness to implement crowdsourcing (Devece et al., 2017). Thus, we propose the following hypothesis:

Hypothesis 1: Market orientation exerts a direct, positive effect on the implementation of crowdsourcing.

Organizational and management capabilities in crowdsourcing implementation

Some RBV scholars consider knowledge to be the key resource to explain companies' competitiveness (Kogut & Zander, 1992; Rahimli, 2012) and learning capability to be the most valuable resource in innovation. Learning involves the acquisition and creation of new knowledge and the application of this knowledge to business. From a dynamic point of view under the RBV, the ability to learn is one of the main sources of competitive advantage (Chen, Lin & Chang, 2009). In the literature, some

innovation and organizational learning definitions overlap (Palacios-Marques et al., 2016). In the case of implementing crowdsourcing for product and service innovations, organizational learning capability is considered the most relevant organizational capability in the theoretical model. As Gatautisa and Vitkauskait (2014) point out, the implementation of crowdsourcing needs procedures for effective filtering and considering ideas that are supplied by the crowd.

On the other hand, management capabilities or competencies are a key element in strategy implementation. Managers are responsible for establishing the mission that steers the formulation and implementation of the strategy from which all other organizational competencies are developed (Humphreys, & Einstein, 2003). In the specific case of innovation, efforts must follow a strategic direction (Battistella, Biotto, & De Toni, 2012), and managers provide the vision and motivation to advance in this direction.

The concept of management or managerial competencies encompasses the individual skills and knowledge of managers. Researchers differ in terms of the dimensions that they ascribe to managerial competencies. For example, Lado and Wilson (1994, p. 703) cited only two dimensions: the articulation of a strategic vision and the establishment of a beneficial link with the environment. Lado et al. (1992), however, identified a third dimension, leadership, which is independent of the dimension of strategic vision. The managerial ability of leadership—that is, being capable of transmitting the mission and securing the commitment of the entire organization, allowing the members of the organization to act collectively rather than in isolation—is also considered a key success factor for organizations (Lado & Wilson, 1994).

In our study we explore the direct and indirect effects of managerial competencies on crowdsourcing implementation. We seek to understand this relationship by focusing

on the specific aspects of managerial competencies with respect to the implementation of IT initiatives, limiting ourselves to transformational leadership, which we describe below.

Transformational leadership

Transformational leadership motivates followers to perform at a higher-than-expected level (Resick, Whitman, Weingarden, & Hiller, 2009) through emotional attachment to the leader (Hartog, Muijen, & Koopman, 1997). Transformational leadership has four components: inspirational motivation, intellectual stimulation, individual consideration, and idealized influence (Bass, 1985). According to Jung, Wu, and Chow (2008), the manager's transformational leadership plays a vital role in leading, driving, and executing innovation strategies. Empirical evidence shows that transformational leadership is an essential driver in exploring new business models and in carrying out organizational innovations (Giesen, Riddleberger, Christner, & Bell, 2010). Transformational leadership is associated with higher levels of employee creativity (Garcia-Morales, Jimenez-Barrionuevo, & Gutierrez-Gutierrez, 2011) and has a direct, positive effect on organizational innovation (Zuraik, 2019). It therefore has a direct, positive effect on the implementation of innovation-related practices such as crowdsourcing. Thus, we propose the second hypothesis as follows:

Hypothesis 2: Transformational leadership exerts a direct, positive effect on crowdsourcing implementation.

Organizational learning capability

Organizational learning is the ability to develop new knowledge that is valuable to the firm. The concept has been extensively developed in the literature over the last 30 years (Çömleka, Kitapçı, Çelikk, & Özşahind, 2012; King, 2009). Organizational learning

is the knowledge between organizational action and the organization's environment (Daft & Weick, 1984; Templeton, Lewis, & Snyder, 2002). In this sense, organizational learning must be a success factor in the application of crowdsourcing to marketing if firms integrate external knowledge through inlearning (Bouncken & Kraus, 2013). The ability to absorb external knowledge increases joint product and service innovation (Bouncken, Plüschke, Pesch & Kraus, 2016).

Within the RBV, the concept of learning has been developed under the name of organizational learning capacity or capability (Chiva, Alegre, & Lapiedra, 2007). System orientation, adequate organizational climate, knowledge acquisition, knowledge utilization, and dissemination orientation are the major considerations in the development of organizational learning capability (Teo & Wang, 2005).

Organizational learning capability positively affects innovation activities; without the right complementary organizational learning capabilities to help integrate the information gathered in the system, crowdsourcing platforms are ineffective. Therefore, organizational learning capability should play a decisive role in the integration of crowdsourcing platforms in company processes, forming an essential part of the management of any information generated (Coelho, Nunes & Vieira, 2018). Thus, we propose the following hypothesis:

Hypothesis 3: Organizational learning capability exerts a direct positive effect on crowdsourcing implementation.

From an infrastructure point of view, the development of market orientation through technological tools such as crowdsourcing can easily be implemented. Nevertheless, this development of market orientation is strongly influenced by organizational capabilities and competencies regarding the use of crowdsourcing

platforms more than by the information systems themselves. This scenario hinders the implementation of crowdsourcing not because of the IT innovation itself but because of the need to be combined with other competencies. The necessity of complementary competencies also implies that a market-oriented strategy based on IT alone would not guarantee the success of IT initiatives in marketing. Thus, transformational leadership and organizational learning capability should be expected to moderate the relationship between market orientation and crowdsourcing. Hypotheses 3 and 4 reflects this rationale:

Hypothesis 4: Transformational leadership moderates the relationship between market orientation and crowdsourcing.

Hypothesis 5: Organizational learning capability moderates the relationship between market orientation and crowdsourcing.

Method

Sample and data

The survey for this study was conducted using a self-administered structured questionnaire sent to general managers of 500 firms in the Spanish telecommunications and biotechnology industries. These two sectors were selected because of their intensive use of information (McEvily & Chakravarthy, 2002). The survey was carried out between May 2015 and September 2015 following Dillman's (2000) procedure. In total, 221 valid questionnaires (102 from telecom companies and 119 from biotech companies) were received. The response rate was 44%. Only 10 out of the 221 firms had more than 500 employees. The average age of the respondents was 53 years, 86 % were men and 45% had higher education.

The non-response bias was controlled using the number of employees. The non-response bias was non-significant. The differences in the response rate, means, and variances between the telecom and biotech industries were non-significant.

Variable measurement

The scales for the questionnaire items are described below. All items were measured on a seven-point Likert-type scale (1 = strongly disagree; 7 = strongly agree).

Market orientation is a key construct in marketing. There are several measurement scales in the literature. There are two main approaches to operationalizing market orientation: the first approach is epitomized by Narver and Slater's (1990) scale, which focuses on customer orientation, competitor orientation, and inter-functional coordination. The second approach is Jaworski and Kohli's (1993) scale, which measures the organization's intelligence generation, intelligence dissemination, and responsiveness (Oczkowski & Farrell, 1998). The scale selection should depend on the theory and objective of the study. In this study, Narver and Slater's scale was chosen because this scale better reflects the marketing strategy described in the hypotheses and avoids the overlap due to the similarities between Jaworski and Kohli's scale and the organizational learning capability and crowdsourcing scales. Of the three dimensions proposed by Narver and Slater (1990), we focused on customer orientation, which is the strategic philosophy that guides market orientation and compels the company to consider clients as co-creators of value (Prahalad & Ramaswamy, 2004). Accordingly, the scale proposed by Deshpandé and Farley (1998) was chosen to measure market orientation. The seven items that form the one-dimensional scale of market orientation are shown in the appendix.

The concept of crowdsourcing used in the hypotheses is closely linked to product and service innovation. The operationalization of crowdsourcing must reflect this

concept. Given the novelty of crowdsourcing, few studies offer measurement scales for this construct. In the literature, one of the most relevant and well-validated scales that are suited to this study is that of Xu, Ribeiro-Soriano, and Gonzalez-Garcia (2015).

This scale includes IT initiatives related to accessing collective knowledge in virtual networks where the firm encourages customers to contribute through creative ideas (Marjanovic, Fry, & Chataway, 2012). The crowdsourcing scale has eight items (see appendix).

To measure transformational leadership, five items were selected from the inspirational motivation and intellectual stimulation dimensions proposed by Bass (1999). The other two dimensions (idealized influence and individualized consideration) of transformational leadership (Bass, 1985) were not considered in this study. The five items are shown in the appendix.

The scale chosen to measure organizational learning capability was proposed and validated by Chiva et al. (2007). This scale draws upon the learning organization and organizational learning literature and offers a comprehensive instrument. It suits our approach to competencies. The scale has 14 items (see appendix) grouped in the following five dimensions: 1) Experimentation 2) Risk taking 3) Interaction with the external environment 4) Dialogue 5) Participative decision-making.

Two control variables (size and industry) were used to test possible misleading results. The size of the organization is a key factor that determines organizational structure and processes (Ravichandran & Lertwongsatien, 2005), influencing management capabilities and challenges. Size was measured as the number of employees. A dichotomous variable was used to indicate whether the company belongs to the Spanish telecommunications (0) or biotechnology (1) industry.

Analysis and results

Descriptive analysis, factor analyses, correlations, and PLS-SEM analyses were used to study the data. Exploratory factor analyses (EFA) with varimax rotation were performed to evaluate the four scales and test the common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All scales had a single factor, except the organizational learning capability scale, which had four factors: experimentation and risk taking, environment interaction, dialogue, and participative decision-making (see Figure 1). Two theoretical dimensions of organizational learning capability (experimentation and risk-taking) were grouped into a single factor in the EFA. The following items with weak loadings were eliminated to improve the reliability of the scales: CS4 and CS5 from the crowdsourcing scale and TL2 from the transformational leadership scale.

The correlations, means, and standard deviations of the variables, which were calculated by averaging the item scores, appear in Table 1. Cronbach's alpha, which was used to estimate reliability for scales, appears in parentheses.

Table 1. Means, standard deviations, and correlations

	Mean	SD	1	2	3	4	5	6	7	8
1. Market Orientation	4.23	1.51	(.96)							
2. Transformational leadership	5.06	.71	-.13	(.77)						
3. OCL Experimentation & risk-taking	5.07	.72	.12	.14*	(.81)					
4. OCL Environment interaction	4.82	.79	.14*	.03	.20**	(.71)				
5. OCL Dialogue	4.88	.67	.10	.03	.24**	.38**	(.81)			
6. OCL Participative decision-making	5.0	.65	.11	.19**	.44*	.15*	.24**	(.79)		
7. Crowdsourcing	4.92	.94	.39**	.12	.00	-.05	.02	.04	(.89)	
8. Size (no. employees)	132	458	-.01	.01	.01	.00	-.04	-.08	-.05	
9. Industry	.55	.50	-.01	-.01	-.02	-.01	-.03	.02	.03	-.10

Notes: n = 221; * p < .05, ** p < .01; Cronbach's alpha appears in parentheses.

The hypotheses were tested using PLS-SEM. Smart-PLS software was used. PLS path modeling (or the partial least squares approach to SEM) offers an alternative to the more widely used covariance-based approach (Sarstedt, Ringle, & Hair, 2014). PLS-SEM

does not require strict assumptions about how the data are distributed and is robust when dealing with small samples.

To avoid introducing non-significant control variables that usually deteriorates the fit of the model (Kline, 1998), we tested the influence of the control variables by regressing crowdsourcing on size and industry. None of the regression coefficients were statistically significant ($p < 0.05$). Thus, the control variables were suppressed from the PLS models.

Several models were used to test the hypotheses. Model 1 (Figure 1) was taken as the base model which only tests the direct effects (hypothesis 1, 2 and 3). Afterwards, following the recommendations for the evaluation of causal models in management research (Piccolo & Colquitt, 2006), we conducted additional analyses on alternative models to test the moderating effects proposed in hypothesis 4 and 5.

The measuring model was evaluated in model 1. Figure 1 shows the direct relationships between constructs (path coefficients) and the item loadings in the measurement model. The individual standardized loadings were all higher than the recommended threshold of 0.7. The structural model enabled testing of hypotheses 1, 2, and 3. Hypotheses 1 and 2 were confirmed because of the significant value of the path between market orientation and crowdsourcing (0.418; $p < 0.01$) and between transformational leadership and crowdsourcing (0.197; $p < 0.01$), respectively. The p values (not shown in Figure 1) were estimated with bootstrapping (Streukens & Leroi-Werelds, 2016). Hypothesis 3 was not confirmed. There was no significant direct effect of the four dimensions of organizational learning capability on crowdsourcing. Regarding the relationship between transformational leadership and organizational learning capability, only one factor (experimentation and risk-taking) of organizational learning capability had a significant path coefficient (0.16; $p = 0.04$). The significance of

participative decision-making was less than 95% (0.16; $p = 0.08$). The low explanatory power of the model for crowdsourcing ($R^2 = 0.23$) is justified because crowdsourcing is a complex construct that is influenced by multiple organizational and environmental variables, and Model 1 did not include moderating relationships.

The fit of Model 1 was low (NFI = 0.8) because of the number of constructs (organizational learning capability) without any significant relationship. The composite reliability, average variance extracted (AVE), and collinearity of the scales in Model 1 appear in Table 2. All composite reliabilities were greater than the threshold of 0.70 (Hair, Hult, Ringle, & Sarstedt, 2013). All AVE values were close to 0.70, indicating a sufficient degree of convergent validity.

Figure 1. Model 1: PLS-SEM analysis of direct effects

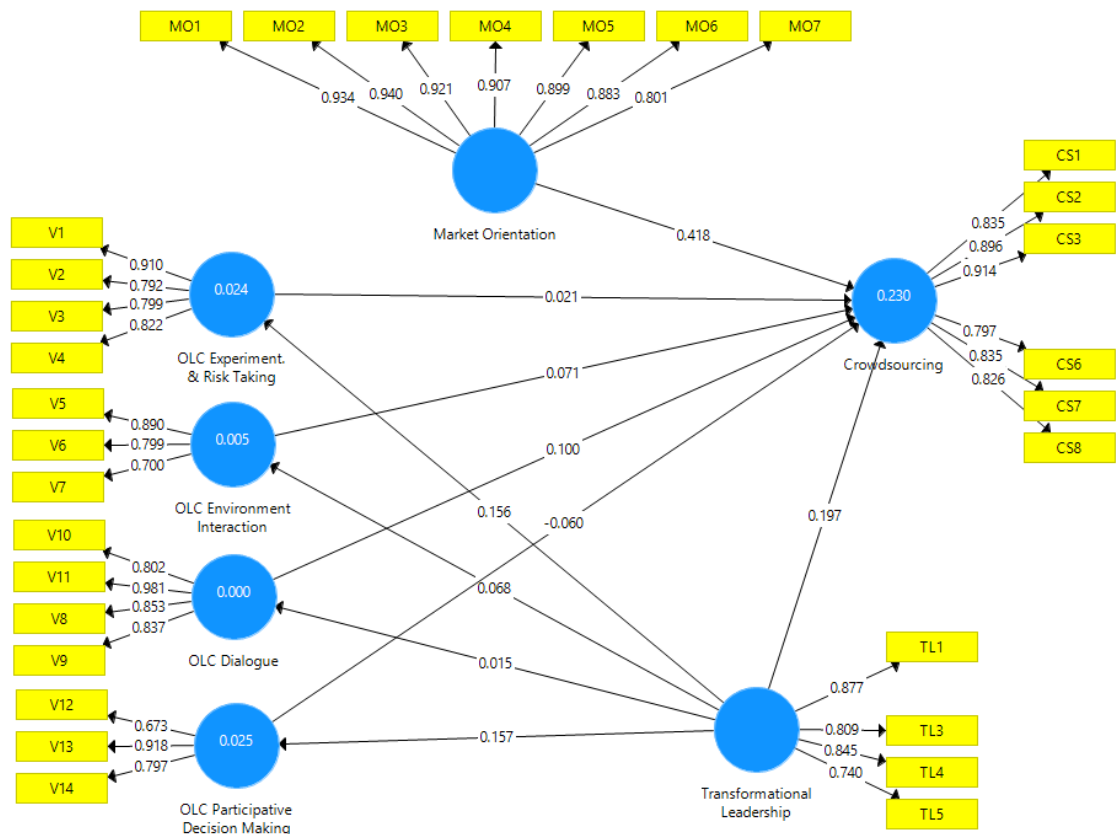


Table 2. Reliability and collinearity of the constructs in Figure 1 (Model 1).

Construct	Rho	Composite reliability	AVE	Inner VIF with crowdsourcing	Inner VIF with transformational leadership
Crowdsourcing	.93	.94	.73		
Market orientation	.97	.97	.81	1.074	
OLC experimentation & risk-taking	1.00	.90	.69	1.150	1.000
OLC environment interaction	.78	.84	.65	1.091	1.000
OLC dialogue	.98	.93	.76	1.330	1.000
OLC participative decision-making	.91	.84	.65	1.348	1.000
Transformational leadership	.88	.89	.67	1.074	

Notes: OLC = organizational learning capability.

After analyzing Model 1, alternative models were tested where a moderating effect was added to model 1 (models 2, 3, 4, 5 and 6, see table 3) and the path between transformational leadership and all the OLC dimensions suppressed (in order to keep all moderator constructs exogenous). Only one moderating effect was added at a time to Model 1 to avoid collinearity. The path coefficient and significance of the moderating variable on crowdsourcing for each of these 5 new models appear in Table 3.

Table 3. Moderating effects on the relationship between market orientation and crowdsourcing

Alternative Model	Moderating construct added to Model 1	Path coefficient	p
Model 2	Transformational leadership*Market orientation	0.24	0.001
Model 3	OLC experimentation & risk-taking*Market orientation	0.207	0.004
Model 4	OLC environment interaction*Market orientation	0.18	0.014
Model 5	OLC dialogue*Market orientation	0.006	0.917
Model 6	OLC participative decision-making*Market orientation	0.018	0.789

Notes: Each moderating variable was tested in Model 1 in isolation (i.e., without the other moderating variables).

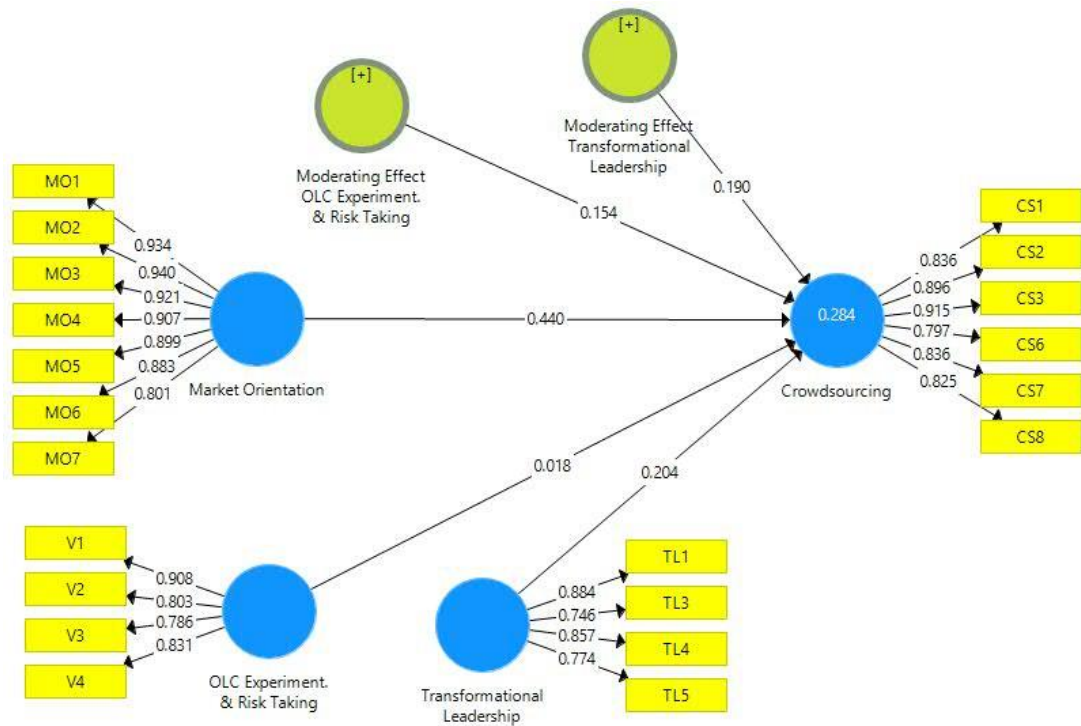
As Table 3 shows, transformational leadership had a significant moderating effect on the relationship between strategy (market orientation) and the implementation of marketing-related practices (crowdsourcing of product development and improvement). The moderating effects of the dimensions of organizational learning capability varied.

Experiment and risk-taking and environment interaction had significant moderating effects (see Table 3). The moderating effects of dialogue and participative decision-making were non-significant.

Several competing models were used to test the moderating effects of models 2, 3 and 4 together. When the moderating effect of transformational leadership was included in the model, only the moderating effect of experimentation and risk-taking was significant. The model with the highest explanatory power for crowdsourcing and the best fit to the data is depicted in Figure 2 (Model 7). The composite reliability, AVE, and collinearity of the scales in Model 7 appear in Table 4.

This alternative model confirms hypothesis 4. The moderating effect of transformational leadership had a path coefficient of 0.190 and a p-value of 0.003 (bootstrapping not shown in Figure 2). Model 7 also partially confirms hypothesis 5 (only the moderating effect of two dimensions of organizational learning capability, experimentation and risk-taking, was confirmed), with a path coefficient of 0.154 and a p-value of 0.018. The path coefficients used to test hypotheses 1 and 2 were significant at 99%, but the direct relationship between experimentation and risk-taking and crowdsourcing was very weak when the moderating effects were included (0.018; $p = 0.77$).

Figure 2. Model 7: PLS-SEM analysis of direct and moderating effects



Model 7 explains 28% of the variance of crowdsourcing. This value is considerably higher than the value for Model 1.

Table 4. Reliability and collinearity of the constructs in Figure 2 (Model 7).

Construct	Rho	Composite reliability	AVE	Inner VIF with crowdsourcing
Crowdsourcing	.93	.94	.73	
Market orientation	.97	.97	.81	1.069
Experimentation & risk-taking*Market orientation	1.00	1.00	1.00	1.102
Transformational leadership*Market orientation	1.00	1.00	1.00	1.112
OLC experimentation & risk-taking	.99	.90	.70	1.086
Transformational leadership	.90	.89	.67	1.075

Discussion and conclusions

This study explores the relationship between strategy (market orientation) and the implementation of IT-based practices (crowdsourcing) that support this strategy. The results of the analysis confirm the assumptions made about the significant relationship between market orientation and crowdsourcing. These findings are consistent with

previous studies that highlight the importance of strategy in network initiatives (Mazurek, 2018).

The most relevant finding is the strategic vision that market orientation provides to crowdsourcing initiatives in order to be successful. All practice must be shaped by a strategic vision, although this vision is moderated by the competencies and capabilities of the organization. The characteristics of crowdsourcing applied to product and service innovation make it an important tool for market orientation. Market orientation calls for obtaining information about products and services, customer preferences, competitors, technology, and market evolution. This need for information about the environment requires a competitive intelligence system that provides quantitative and qualitative information. At the same time, technology platforms such as crowdsourcing applications need complementary capabilities and competencies to be effective. The empirical results show that managers' transformational leadership plays a key role in enabling crowdsourcing implementation. At the same time, transformational leadership is a significant moderator in the implementation of strategy. The results show this moderating effect on the relationship between market orientation and crowdsourcing. Although the explanatory power of the hypothesized model is relatively low, the high significance of the path coefficients for the effects of both market orientation and transformational leadership on crowdsourcing supports the relevance of these two factors. The results regarding moderating effects further show that transformational leadership affects crowdsourcing both directly and indirectly.

The findings differ in the case of organizational learning capability. First, no dimension of organizational learning has a significant direct effect on crowdsourcing. The effects on crowdsourcing are indirect, occurring through moderation of the relationship

with market orientation. This moderating effect can be observed only for experimentation and risk-taking and environment interaction.

These results have implications for strategies designed to enable firms to compete through product and service innovation. In a world where an increasing number of people are participating in sharing and exchanging information, knowledge and data (Richter, Kraus, Brem, Durst, & Giselbrecht, 2017), market intelligence can be obtained by crowdsourcing. In the implementation of crowdsourcing, technology plays a prominent role. However, technology initiatives must be shaped by a clear vision and strategy. Technological capabilities must be complemented by organizational and managerial competencies (Devece, 2013).

This study sheds light on some research inconsistencies found in the relationship between market orientation and performance in high competitive and dynamic environments (Gonzalez-Benito, Gonzalez-Benito & Munoz-Gallego, 2014). The discrepancies found in the literature can be due to the inadequacy of market orientation implementation. Crowdsourcing used in service and product innovation in contexts with competitive intensity and technological turbulence (Johnson, Fisher & Friend, 2019) can be an appropriate tool to enhance market orientation implementation (Lang et al., 2016).

Regarding the limitations of the study, the drawbacks of using a survey to gather data should be noted. Common method bias in self-administered surveys is always a concern, although several analyses such as Harman's single factor test were performed to ensure the validity of the data. A sample with only two industries in a single country limits the generalization of the results. The use of several constructs in the model with high correlations and complex relationships increases the likelihood of collinearity when moderation is introduced. Nevertheless, the distinction of the dimensions of

organizational learning capability sheds light on complementary actions that can be taken to improve crowdsourcing implementation.

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Appendix: Measurement scales

Item	Market Orientation (Deshpandé & Farley, 1998)
MO1	Our business objectives are driven primarily by customer satisfaction.
MO2	We constantly monitor our level of commitment and orientation to serving customer needs.
MO3	Our strategy for competitive advantage is based upon our understanding of customer needs.
MO4	We measure customer satisfaction systematically and frequently.
MO5	We are more customer-focused than our competitor(s).
MO6	We poll end users at least once a year to assess the quality of our products and services.
MO7	Data on customer satisfaction are disseminated at all levels in this business unit on a regular basis.

Item	Crowdsourcing (Xu et al., 2015)
CS1	The organization has introduced platforms to develop ideas about new products or services.
CS2	Users can freely express their ideas about the introduction of new innovations in the firm.
CS3	The firm considers that a group of users can develop new ideas about new products or services or improve existing ones.
CS4	There are financial and non-financial incentives to develop the best ideas.
CS5	The firm has evaluation systems to assess the effectiveness of ideas.
CS6	There are knowledge transfer systems to disseminate the best ideas.
CS7	The firm uses virtual communities to develop new products or services.
CS8	New ideas consider the stakeholders of the firm.

Item	Transformational Leadership (Bass, 1999)
TL1	The leader encourages me to perform more than I am expected to.
TL2	The leader increases my motivation to achieve individual and organizational goals.
TL3	The leader encourages me to think more creatively and be more innovative.
TL4	The leader sets challenging standards for all tasks given to me.
TL5	The leader gets me to rethink ideas that I had never questioned before.

Item	Organizational Learning Capability (Chiva et al., 2007).
Experimentation	
V1	People here receive support and encouragement when presenting new ideas
V2	Initiative often receives a favorable response here, so people feel encouraged to generate new ideas
Risk taking	
V3	People are encouraged to take risks in this organization.
V4	People here often venture into unknown territory.
Interaction with the external environment	
V5	It is part of the work of all staff to collect, bring back, and report information about what is going on outside the company.
V6	There are systems and procedures for receiving, collating and sharing information from outside the company.
V7	People are encouraged to interact with the environment: competitors, customers, technological institutes, universities, suppliers etc.
Dialogue	
V8	Employees are encouraged to communicate.
V9	There is a free and open communication within my work group.
V10	Managers facilitate communication.
V11	Cross-functional teamwork is a common practice here.
Participative decision-making	
V12	Managers in this organization frequently involve employees in important decisions.
V13	Policies are significantly influenced by the view of employees.
V14	People feel involved in main company decisions.