The effect of online social networks and competency-based management on innovation capability

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Abstract

Purpose – *The purpose of this paper is to explore the effect of online social networks and competency-based management on innovation capability.*

Design/methodology/approach – *The paper is theory-confirming. Theoretical relationships were tested using an empirical study of 289 firms from the Spanish biotechnology and telecommunications industries.*

Findings – *Results confirm that online social network use for internal cognitive processes (e.g. reading, searching and storing information) and external cognitive processes (e.g. sharing and co-creating knowledge) positively affects knowledge transfer. This knowledge helps firms to achieve superior competency in R&D to succeed in innovation programs.*

Research Limitations/implications – *All survey respondents were from Spain, which may limit the generalizability of findings. A longitudinal approach was not used. However, doing so would make it possible to explore time lags between online social network use, competency-based management and innovation.*

Practical Implications – *This paper highlights the potential as well as the limitations of online social networks and competency-based management in promoting innovation capability. Businesses must consciously manage the assimilation and use of online social networks to benefit from them.*

Originality/value – *The study contributes to the literature by identifying effects on innovation capability at the meso-level (i.e. online social networks). Findings highlight the need for a shift in focus away from collaborating and interacting in online social networks (micro-level) and organizational contexts (macro-level) so as to improve innovation capability.*

Keywords *Information systems, Knowledge transfer*

Paper type *Research paper*

1. Introduction

The popularity and growth of online social networks means the Internet has become a unique environment within which innovations emerge and spread. Members of online social networks present their perceptions and ideas about firms' products or services. The possibility of establishing contacts without limitations on space increases the dynamism and complexity of relationships between online social networks' members (Chua and Banerjee, 2013; Flanagin and Bator, 2011). Because online social networks create a high volume of opinions and comments, these networks need mechanisms that filter information and create knowledge so that firms can develop new products and improve existing products. Managers have realized that adopting and integrating online social networks is necessary for firms to compete, but managers have also realized that they have much to learn about how they can most positively affect firm performance.

Although studies have related knowledge transfer to innovation, scarce literature explains how knowledge is created through online social networks, and how this knowledge is disseminated among employees and throughout firms (Matschke *et al.*, 2012; Levy, 2009; Razmerita *et al.*, 2009; Sotirios and Alya, 2009). Many firms continue to grapple with how

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best to use different channels, gauge performance and integrate social media into their strategies (Kaplan and Haenlein, 2010).

The literature review discusses how online social network use empowers employees to engage in conversational and collaborative knowledge management, both of which enrich their cognitive and creative processes (Palacios-Marqués *et al.*, 2015a; Wong *et al.*, 2011; Zhang *et al.*, 2009; McLure and Faraj, 2005; Subramani and Peddibhotla, 2004). Given online social networks' relevance, this study explores how knowledge is transferred in online social networks and how new knowledge affects firms' innovation capability. This research goal is relevant. Although many studies have addressed knowledge transfer in traditional media, the literature lacks studies on how social networks generate useful knowledge for firms to launch new products or improve existing products.

Following this introduction, Section 2 discusses the relationship between online social networks, competency-based management, knowledge transfer and innovation capability. Section 3 explains the empirical design used in this research. Finally, Section 4 presents results and discusses their relevance as regards existing knowledge.

2. Literature review

For many firms, online social networks are still an experiment where small groups of employees from the marketing or communications department launch isolated projects. Online social networking websites provide public forums that give individual customers a platform to voice opinions and access product information to help their purchase decisions (Palacios-Marqués *et al.*, 2015a, 2015b; Flanagin and Bator, 2011; Kozinets *et al.*, 2010).

The majority of firms lack the necessary knowledge within their formal boundaries and must rely on links to external organizations to acquire knowledge (McLure and Faraj, 2005; Anand *et al.*, 2002). In knowledge-intensive sectors, innovation capability derives from knowledge exchange and learning through online social networks that cross organizational boundaries (Nooteboom, 2000).

Despite the existence of multiple conceptualizations of knowledge management, the literature shows there is consensus as to what defines the knowledge management stages in which firms create, codify, exchange, disseminate and use knowledge to create value (Liebowitz, 2005; Rowley, 2000). For knowledge to create value in firms, firms must foster new ideas and change (Hegde and Shapira, 2007; Razmerita *et al.*, 2009). The increasing number of theoretical works on knowledge management owes to its practical significance for managers as well as to the development of the knowledge-based approach (KBA) (Von Krogh *et al.*, 2000; Nonaka and Takeuchi, 1995; Nonaka, 1994). The KBA has shown that because knowledge is a valuable, rare, imperfectly imitable and non-substitutable resource, it leads to sustainable competitive advantage (Teece, 1998; Grant, 1996).

Chu and Du (2013) recently examined the use of Facebook by public libraries and universities in English-speaking countries. They classified Facebook as a knowledge management tool after they observed numerous posts that shared knowledge and disseminated information. Facebook's effect on firms can also be studied. Traditionally, users access firms' websites via search engines. However, this trend appears to be changing with users now accessing firms' websites via social network profiles.

In this sense, Facebook and other social networks embody communities of practice (Palacios-Marqués *et al.*, 2015a, 2015b; Wong *et al.*, 2011). Communities of practice are groups of users with a common concern who seek to share knowledge with others within the group. Ardichvili *et al.* (2006) argue that there are numerous reasons for individuals to share their knowledge with other members of a community of practice, ranging from self-esteem boosting to altruistic and conformist considerations. Furthermore, internal stimuli play a more predominant role than external stimuli do. Communities of practice encourage collaboration and knowledge sharing over the Internet (Hass *et al.*, 2015; Gunawardena *et al.*, 2009; Ardichvili *et al.*, 2006). Following this line of theoretical argument, we can state the first hypothesis:

H1. Online social network use directly and positively affects knowledge transfer.

Competency-based management involves measuring and judging employees' competencies to determine career development plans according to the firm's objectives. Delamare Le Deist and Winterton (2005) claim that competencies are enduring personal qualities common to many situations and settings. Competencies refer not only to individual qualities but also to work functions that require team collaboration.

So that all human resources functions are consistent with employees' competencies, firms must develop technological platforms that transfer these intangible assets and make them explicit. Thus, firms should develop mechanisms to define long-term personal development goals, establish learning aims for employees to acquire competencies and design platforms to record, map and track competencies (Paroutis and Saleh, 2009; Revilla *et al.*, 2009).

Employees possess behavioral and technical competencies. Behavioral competencies include skills such as creativity, communication and problem-solving. These competencies can be crosscutting, and appear in different jobs within the firm, whereas technical competencies may apply to a specific job. In this vein, authors such as Rothwell (2002) and Rodriguez *et al.* (2002) have asserted that all workers require certain core competencies.

Firms should introduce training programs that allow employees to apply both technical and behavioral competencies to prepare for changes that arise in different jobs. Such training programs mitigate operational risks because firms identify competency gaps, and reduce costs, because firms identify real training needs (Ardichvili *et al.*, 2006; Nooteboom, 2000; Rowley, 2000).

Competency models let firms develop holistic approaches to examine an employee's current competencies and those that he or she may still need to acquire in a given industry or occupation. Human resources can then apply the knowledge to develop the workforce (Rodriguez *et al.*, 2002).

Today, online social networks are widely used to advertise job openings and select candidates. Through some internal selection algorithm, firms are capable of selecting candidates that best meet the competencies required for the job. By combining these platforms with systems that capture employees' tacit knowledge, firms can improve their decision-making (Panahi *et al.*, 2013).

Therefore, firms that use a management system based on competencies gain explicit knowledge about their employees' skills and abilities. This insight allows them to develop

"Results show that knowledge transfer mediates relationships between competency-based management, online social network use and innovation capability."

better systems for transferring knowledge. Building on the previous theoretical argument, we state *H2* as follows:

H2. Competency-based management directly and positively affects knowledge transfer.

Numerous studies have investigated the effect of knowledge management on firms' innovation performance (Soto-Acosta *et al.*, 2015; Cantner *et al.*, 2009; Revilla *et al.*, 2009; Zhang *et al.*, 2009). Calantone *et al.* (2002) reported that the distinction between tacit and explicit knowledge is crucial to understanding knowledge transfer's effect on innovation capability. When more tacit knowledge is generated within the firm, employees find it easier to create new products and improve existing products. This relationship could be moderated by collaborative experience and firm size. Competitors find it hard to replicate tacit knowledge, which means that if firms use tacit knowledge to innovate, they will more easily gain competitive advantage (Panahi *et al.*, 2013).

Codifying tacit knowledge developed by a firm's employees enables knowledge dissemination. Codification provides a mechanism for knowledge to evolve because codification encourages new proposals that modify present routines (Panahi *et al.*, 2013; Cantner *et al.*, 2009; Awad and Ghaziri, 2004).

The implementation of innovative activities somehow forces firms to change or renew their stocks of tangible and intangible assets. These intangible assets may be considered to some degree as capabilities or competencies obtained through learning processes, and they constitute a principal element of innovation capability (Soto-Acosta *et al.*, 2015; Zhang *et al.*, 2009; Hegde and Shapira, 2007; Cantner *et al.*, 2009; Calantone *et al.*, 2002; Thomke and von Hippel, 2002).

Although internal knowledge transfer is crucial if firms want to increase their innovation capability, analyzing the external agents that relate to the business is also necessary. In fact, in knowledge-intensive industries, where technological change and market pressure predominate, innovation is riskier and more costly. In this sense, online social networks can provide knowledge from partners. This external knowledge provision can reduce innovation costs by using a first-time-right approach. Knowledge transfer between different firms depends on proximity and can be complemented using technological tools (Zhang, 2011; Dalmaris *et al.*, 2007; Van Geenhuizen and Indarti, 2005).

Firms that focus on knowledge transfer give their human capital rapid access to technologies. Internal knowledge transfer occurs when firms use and acquire knowledge-based assets (Hegde and Shapira, 2007; Bouty, 2000). The spread of organizational memory promotes a firm's capability to apply innovations, replace obsolete knowledge and try alternatives.

Van Geenhuizen and Indarti (2005) argue that new knowledge affects a sector's innovativeness. New knowledge may come from various sources such as online social networks, mass media or customers. In a cluster with a high social capital, knowledge is distributed evenly, and there are more opportunities for innovation:

H3. Knowledge transfer directly and positively affects innovation capability.

Online social networks encourage underlying innovations to emerge and spread (Paroutis and Saleh, 2009). This makes online social networks relevant not only for multinationals but

also for small- and medium-sized enterprises, and even for non-profit and governmental agencies (Kaplan and Haenlein, 2010).

For knowledge transfer via online social networks to be effective, a set of conditions is necessary (Flanagin and Bator, 2011; Paroutis and Saleh, 2009). First, members of these networks must convert tacit knowledge to explicit knowledge. Tacit knowledge might be entangled within its context. In fact, if tacit knowledge is converted to explicit knowledge and used in another context, it might cease to be usable (Panahi *et al.*, 2013; Liebowitz, 2005; Awad and Ghaziri, 2004). A second condition is to eliminate cultural barriers that hinder employees' participation in online social networks (Lee *et al.*, 2014; Prensky, 2001).

Awad and Ghaziri (2004) classified users that participate in online social networks, differentiating between expert workers and knowledge workers. Expert workers rarely use the online social network because they have sufficient tacit knowledge to perform their functions. In contrast, knowledge workers use the online social network if expert workers deposit sufficient information. The challenge for firms is to encourage expert workers to share their knowledge while persuading knowledge workers to access the internal network to use this knowledge (Gebert *et al.*, 2003). Similarly, Prensky (2001) distinguished between digital natives and digital immigrants. Digital natives are born into digital wealth. They feel comfortable using technological applications. Conversely, digital immigrants are unfamiliar with technological tools.

Privacy is another important consideration. Traditionally, a small number of employees, generally belonging to top management, develop knowledge management systems (Zhang, 2011; Liebowitz, 2005). In contrast, in the new technological environment, a user-centered design lets all users design the system (Thomke and von Hippel, 2002).

Despite firms' growing awareness of the need to share knowledge, some employees remain reluctant to share and deposit their most valuable knowledge on a technological platform (Flanagin and Bator, 2011; Levy, 2009; Dalmaris *et al.*, 2007). Some firms have suggested publishing contents anonymously or under pseudonyms, but this may dilute the quality of the intranet content.

The diversity of an online social network's members is something firms must consider because the literature review reveals opposing views regarding the benefits or drawbacks of diversity among online social network users. Whereas Daft (1998) claims that high diversity among community members can negatively affect interaction among its members, Subramani and Peddibhotla (2004, p. 3) claim that diversity significantly helps employees to achieve results. Kuo-Ming (2009, p. 282) reports that professional diversity can positively affect the community's behavior, but that an extremely wide range of opinions might have a negative effect. The use of multidisciplinary teams with a holistic vision of the firm can benefit knowledge transfer between a network's members (Rowley, 2002).

Present in 32 countries worldwide, the global telecommunications firm Orange aims to bring the digital universe to the masses through the internet, phones and corporate business solutions. For this purpose, its customers use online social networks to connect with brand ambassadors, discover product updates and receive technical support. The aim is to develop a one-to-one interaction with its customers. It also strengthens customers' relationships with the brand (Thomke and von Hippel, 2002).

A firm that has successfully used online social networks to innovate is Lego. Through its website, Lego offers users the chance to design Lego products and evaluate existing products. Lego analyzes the best ideas and then transfers knowledge among its departments to innovate. The mediating role of knowledge transfer can be tested through the following hypothesis:

H4. Knowledge transfer mediates relationships between online social network use, competency-based management and innovation capability.

3. Method

3.1 Variable definition

3.1.1 Competency-based management. We used the scale previously tested by Palacios and Garrigos (2005). It meets all psychometric properties required of scales in the social sciences (i.e. dimensionality, validity and reliability). The scale comprises seven items measured on a seven-point Likert scale (1 = *strongly disagree* and 7 = *strongly agree*):

- *CM1*: Employees' skills and competencies are valued to develop employees' professional careers.
- *CM2*: Colleagues help to improve each other's competencies and skills.
- *CM3*: Managers and supervisors support the development of new competencies in subordinates.
- *CM4*: The firm has a competency management system that pays each employee a salary consistent with their competencies.
- *CM5*: The firm has systems for measuring employees' competencies.
- *CM6*: Employee remuneration and promotion systems affect competency development, ideas and knowledge.
- *CM7*: The firm uses benchmarking to improve employees' competencies.

3.1.2 Online social network use. We used Palacios-Marqués *et al.* (2015a, 2015b) measurement scale. This scale meets all psychometric properties required of scales in the social sciences. This scale comprises eight items measured on a seven-point Likert scale (1 = *strongly disagree* and 7 = *strongly agree*):

- *SN1*: The firm has a profile on the most important social networks.
- *SN2*: The firm uses a single strategy when creating profiles so that the image of the firm remains consistent.
- *SN3*: The firm's business strategy determines social networking actions.
- *SN4*: The firm hires personnel to identify processes related to social networks.
- *SN5*: The firm has a community manager to stimulate interaction with users.
- *SN6*: Cross-referenced marketing systems encourage users to interact on social networks where the firm has a profile.
- *SN7*: Promotion policies advertise the firm's products and services on social networks.
- *SN8*: The firm offers incentives to employees who meet objectives related to the development of social networks.

3.1.3 Knowledge transfer. We used Yi's (2009) scale, which meets all psychometric properties required of scales in the social sciences. This scale comprises 28 items measured on a seven-point Likert scale (1 = *strongly disagree* and 7 = *strongly agree*):

- *KT1*: Present documents and reports regularly.
- *KT2*: Publish articles in firm magazines, specialized journals or noticeboards.
- *KT3*: Share documentation from personal files related to current work.
- *KT4*: Contribute ideas and thoughts to the firm through online databases.
- *KT5*: Keep other employees up to date with important firm information through online discussion forums.
- *KT6*: Express ideas and thoughts at firm meetings.

- *KT7*: Participate fully in brainstorming sessions.
- *KT8*: Propose suggestions for solving problems at team meetings.
- *KT9*: Respond to questions from others at team meetings.
- *KT10*: Ask questions that can provoke debate and analysis at team meetings.
- *KT11*: Share success stories that can benefit the firm at organization meetings.
- *KT12*: Share work-related failures to help others to avoid making the same mistakes at firm meetings.
- *KT13*: Make presentations at firm meetings.
- *KT14*: Support less experienced employees during personal work time.
- *KT15*: Participate in long-term training actions for the youngest employees.
- *KT16*: Spend time in personal conversations (e.g. talks in the corridor, during the lunch break and by phone) with others to help them to solve work problems.
- *KT17*: Keep other employees up to date with important firm information through personal conversation.
- *KT18*: Share the passion and emotion of some specific issues with others through personal conversation.
- *KT19*: Share experiences that can help others to avoid risks and problems through personal conversation.
- *KT20*: Have online chats with other employees to help them with their work-related problems.
- *KT21*: Spend time on email communication with other employees to help them with their work-related problems.
- *KT22*: Hold "community" meetings to create innovative solutions to work problems.
- *KT23*: Hold "community" meetings to share own experience and practice on specific issues of common interest.
- *KT24*: Hold "community" meetings to share success, poor results and specific issues of common interest.
- *KT25*: Hold "community" meetings to promote excellence at work.
- *KT26*: Offer personal support for the development of new "communities".
- *KT27*: Send related information to "community" members through the email list.
- *KT28*: Share ideas and thoughts on specific issues with members of the "community" using online systems.

3.1.4 Innovation capability. We used Calantone *et al.*'s (2002) measurement scale, which previous studies have validated. This measurement scale comprises six items measured on a seven-point Likert scale (1 = *strongly disagree* and 7 = *strongly agree*):

- *IC1*: Our firm frequently tries out new ideas.
- *IC2*: Our firm seeks out new ways to do things.
- *IC3*: Our firm is creative in its methods of operation.
- *IC4*: Our firm is often the first to market with new products and services.
- *IC5*: Innovation in our firm is perceived as too risky and is resisted.
- *IC6*: Our volume of new product launches has increased over the past five years.

3.2 Data collection

We collected data between January and July 2014 from Spanish biotechnology and telecommunications firms. In these sectors, knowledge assets are important, and innovation is intensive. Therefore, these sectors are ideal targets for empirical study. Respondents to the email questionnaire were managing directors. Their holistic view means that they could provide informative responses. Before data collection, the measurement instrument was pre-tested in 30 firms: 15 from the telecommunications sector and 15 from the biotechnology sector. After eliminating 19 invalid questionnaires, we obtained 242 valid questionnaires, representing a sampling error of 5.6 per cent at the 95 per cent confidence interval.

Biotechnology firms have high growth potential because they are continually researching and developing new products. In an adverse climate where firms encounter difficulties to access bank financing, 88 per cent of firms in the study were supported mainly by Spanish capital, and needed €200,000 of early-stage capital. Most firms originated through university spin-offs. Of the firms in the study, 69 per cent were consolidated (i.e. had been operating for more than 5 years), 28.2 per cent were new (between 3 and 42 months) and 2.8 per cent were start-ups.

Telecommunications firms in the sample comprised telephone operators, mobile telecommunications firms, telematics and satellite service firms and cable and audiovisual services operators.

The sample comprised two industries where human capital is fundamental to compete, and where knowledge assets are a priority for innovation. Therefore, we combined telecommunications and biotechnology firms into a single sample to generalize results to other knowledge-intensive industries (Dalmaris *et al.*, 2007).

Table I shows the correlation matrix, means and standard deviations.

4. Results

4.1 Validation of the scales

We first confirmed scale validity. Table II reports goodness-of-fit indicators for the initial factorial models. Results provide support for the four constructs.

Table III shows factor loadings. All estimated parameters were statistically significant at 95 per cent ($t > 1.96$). Standardized factor loadings were high (i.e. greater than 0.6). The compound reliability index yielded high scores (online social networks = 0.938; competency-based management = 0.822; knowledge transfer = 0.873; innovativeness

Table I Summary statistics and correlation matrix

		Mean	*SD*	*1*	*2*	*3*
1	Competency-based management	4.152	0.343			
2	Online social networks	5.323	0.397	0.109***		
3	Knowledge transfer	5.886	0.271	0.115***	0.210***	0.147***
4	Innovation capability	6.034	0.334	0.164***	0.168**	0.114**

Notes: ***$p < 0.001$; **$p < 0.01$

Table II Fit indices for the initial factorial models

Scale	*df*	p	*Satorra–Bentler scaled* χ^2	*RMSR*	*BB NNFI*	*IFI*	*NC*
Online social networks	2	0.025	7.871	0.031	0.935	0.978	4.24
Competency-based management	2	0.969	0.061	0.003	1.021	1.007	0.03
Knowledge transfer	9	0.712	6.276	0.025	0.993	0.996	1.27
Innovation capability	2	0.074	5.196	0.031	0.925	0.975	4.88

Table III Factor loading magnitudes and measurement errors

Online social networks			*Competency-based management*			*Knowledge transfer*			*Innovation capability*		
Items	*χ*	*Error*	*Items*	*χ*	*Error*	*Items*	*χ*	*Error*	*Items*	*χ*	*Error*
SN1	0.621*	0.614	CM1	0.899*	0.438	KT1	0.640*	0.769	IN1	0.798*	0.363
SN2	0.790	0.389	CM2	0.881	0.474	KT3	0.756	0.655	IN2	0.861	0.258
SN3	0.908	0.175	CM3	0.785	0.620	KT6	0.760	0.650	IN3	0.832	0.306
SN4	0.600	0.640	CM4	0.640	0.769	KT8	0.783	0.622	IN4	0.941	0.118
SN5	0.865	0.252	CM7	0.760	0.650	KT10	0.777	0.629	IN6	0.788	0.379
SN6	0.888	0.210				KT11	0.785	0.620			
SN7	0.840	0.497				KT12	0.881	0.474			
SN8	0.836	0.301				KT14	0.749	0.662			
						KT16	0.917	0.399			
						KT17	0.768	0.640			
						KT18	0.638	0.770			
						KT19	0.801	0.599			
						KT24	0.825	0.565			
						KT25	0.880	0.474			

Notes: Parameters marked; *were set to equal 1 to fix the latent variable scale

scale = 0.891). Some competency-based management items (Items 5 and 6), knowledge transfer items (Items 2, 4, 5, 7, 9, 13, 15, 20, 21, 22, 23, 26, 27 and 28) and innovation capability items (Item 5) failed to meet the required minimum R^2 value. Nonetheless, we kept these items in the model because they captured content of dimensions, and this content was necessary to demonstrate content validity.

A construct has convergent validity when the measure being evaluated correlates strongly with other measures that evaluate the same concept. Convergent validity can also be verified using the same scale in different populations. The variance captured by a construct should be greater than the measurement error (shared variance > 0.50). All multi-item constructs met this criterion, and each factor loading (λ) related significantly to its underlying factor (*t*-values greater than 4.78). These values implied that convergent validity held. The four constructs represented different constructs, which confirmed discriminant validity.

To verify causal relationships, Tables IV-Table V shows coefficients for the structural equation models. Table V also shows the *t*-values that represent the coefficients' significance. *t*-Values exceeded 1.96 for all hypotheses, which indicates that all relationships were significant.

5. Conclusions and managerial implications

Many firms are adopting online social networks to benefit their businesses. These tools have developed rapidly because they are user-friendly and cheap. Furthermore, they are built around scalable internet- and mobile-based technologies that allow firms to engage in timely, direct end-customer contact, yielding efficiency that lies outside the scope of traditional communication tools. In this article, we explain how firms can use online social networks to innovate, launch new products and improve processes. To satisfy customers, firms must design products that meet customer requirements.

Table IV Fit indices for the hypotheses

Hypothesis	*df*	p	*Satorra–Bentler* χ^2	*RMSR*	*BB NNFI*	*IFI*	*NC*
H1	13	0.393	13.74	0.019	0.997	0.998	1.11
H2	86	0.271	93.53	0.029	0.994	0.996	1.08
H3	62	0.598	58.63	0.025	1	1.002	0.953
H4	245	0.127	270.33	0.054	0.992	0.993	1.08

Table V Coefficients of the structural equation models

Hypotheses	*Coefficient*	*Results*
H1	0.785 $t = 5.214 > 1.96$	Confirmed
H2	0.813 $t = 4.965 > 1.96$	Confirmed
H3	0.893 $t = 6.256 > 1.96$	Confirmed
H4	KT = 0.793 SN + 0.879 CM IN = 0.897 KM $t = 6.285 > 1.96$	Confirmed

Notes: Where KT: knowledge transfer; SN = online social networks; CM = competency-based Management; IC = innovation capability

Traditionally, research into knowledge management has examined factors that affect the volume of organizational knowledge stocks (Wasko and Faraj, 2005). In contrast, our study adopts a focus similar to that of Bharati *et al.* (2015), Chen *et al.* (2011), Durcikova and Gray (2009), Poston and Speier (2005), and Wasko and Faraj (2005), who stress the importance of the quality of knowledge created. Our paper highlights the potential of online social networks and competency-based management as factors capable of creating high-quality knowledge that can improve the firm's innovation capability. We empirically studied two knowledge-intensive industries (i.e. biotechnology and telecommunications) where innovation and social media combine through tools that allow customers to post contents and express their needs (Thomke and von Hippel, 2002).

Results show that knowledge transfer mediates relationships between competency-based management, online social network use and innovation capability. Competency-based management affects knowledge transfer (0.813) more than online social network use affects knowledge transfer (0.785). Thus, competency-based management and online social network use act as antecedents of knowledge transfer. Results also show that in firms that transfer knowledge, it positively and significantly affects innovation capability (0.893).

Firms that use online social networks most effectively are now not only experimenting with multiple channels but are also creating metrics to measure effect, and are using new technologies to understand how to converse with customers. In the future, firms that enter into this new relationship with customers, employees and partners will be leaders in effective online social network use. Online social networks should be capable of creating the intensity of the symbiotic relationship between background and foreground knowledge with the aim of creating core-competences that positively affect the creation of competitive advantage for the firm.

Online social networks and competency-based management should be incorporated into human resources policies and practices. As it affects creativity and knowledge sharing, it is important for firms to stimulate creativity and innovation (Hass *et al.*, 2015). Competency-based management and online social network use help to shape employees' attitudes, behavior and skills, build employee commitment and thereby contribute to creating new ideas at work. Future research should extend this study's scope by introducing new mediating and moderating variables. A longitudinal approach would enable us to explore time lags between online social network use, competency-based management and innovation. In addition, the necessary time could be calibrated to expand knowledge stocks and strengthen their effect on innovation capability.

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