

# RELATIONSHIP BETWEEN INFORMATION SYSTEMS INTEGRATION, INNOVATION AND CONSUMER-BASED COMMITMENT PRACTICES FOR KNOWLEDGE SHARING IN CREATING POWER BRANDS

## ODNOS IZMEĐU INTEGRACIJE INFORMACIJSKIH SUSTAVA, INOVACIJA I PRAKSI UTEMELJENIH NA PREDANOSTI POTROŠAČA ZA DIJELJENJE ZNANJA I STVARANJA SNAŽNIH MARKI



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### Abstract

**Purpose** – The purpose of this paper is to focus on establishing a relationship between the level of consumer commitment through knowledge sharing and what sustains innovation in SMEs through the integration of information systems to build power brands.

**Design/Methodology/Approach** – Several procedures were used to empirically determine the study: a) the Harman one-factor test; b) the common latent factor approach; c) the confirmatory factor-analytic approach to the Harman one-factor test.

**Findings and implications** – The finding highlights the importance of a differentiated approach to developing and managing customer loyalty by appropriately managing and integrating information technology for knowledge sharing with consumers and employees, thus managing innovation for the purpose of power brand deployment and earning profits.

### Sažetak

**Svrha** – Svrha je rada usredotočiti se na uspostavljanje odnosa između razina potrošačeve predanosti u dijeljenju znanja i onoga što održava inovacije u srednjim i malim poduzećima kroz integraciju informacijskih sustava za izgradnju snažnih marki.

**Metodološki pristup** – U empirijskom istraživanju korišteno je nekoliko postupaka, a to su: a) *Harman's single factor test*, b) CLF - *Common Latent Factor pristup*, c) Konfirmatorna faktorska analiza prema testu *Harman's single factor*.

**Rezultati i implikacije** – Nalaz naglašava važnost diferenciranog pristupa u razvoju i upravljanju lojalnošću potrošača, kroz pravilno upravljanje i integriranje informacijske tehnologije za dijeljenje znanja s potrošačima i zaposlenicima, a na taj se način upravlja inovacijama za implementaciju snažne marke i stvaranje profita.

**Limitations** – The review of the related literature is selective rather than comprehensive, and the selection of sample firms is judgmental, making the sample rather skewed demographically. The paper, due to the breadth and complexity of the subject, serves to highlight key issues and bring together ideas. Some topics deserve further explanation. However, this was beyond the scope of this paper.

**Originality** – The main contribution of this paper is that it uniquely identifies an approach to understanding how consumer commitment is sustained through innovation and information system integration. Understanding this approach should lead to effective customer loyalty management and greater awareness of the managing of power brands and the manner in which to foster user loyalty using social media.

**Keywords** – Web-based technology, knowledge sharing, innovation, consumer-based commitment practices.

**Ograničenja** – Pregled literature je selektivan, tj. ne obuhvaća sve, dok je odabrani uzorak poduzeća temeljen na procjeni koja je demografski iskrivljena. Zbog dubine i kompleksnosti teme, rad služi da bi istaknuo ključne probleme i približio ideje. Neke teme zaslužuju daljnja objašnjenja. Međutim, to je bilo izvan opsega ovog rada.

**Doprinos** – Glavni je doprinos rada u jedinstvenom identificiranju pristupa za razumijevanje održive potrošačeve predanosti kroz inovacije i integraciju informacijskih sustava. Razumijevanje ovog pristupa trebalo bi voditi prema učinkovitom upravljanju potrošačevom lojalnošću i većoj svjesnosti u upravljanju snažnim markama te poticanju lojalnosti korisnika putem društvenih mreža.

**Ključne riječi** – tehnologija utemeljena na webu, dijeljenje znanja, inovacije, praksa utemeljena na predanosti potrošača

## 1. INTRODUCTION

The term Web 2.0 was originally coined in the wake of the so-called “dot com bust” to distinguish static websites, in which consumers were only recipients of information, from interactive and dynamic sites allowing them to collaborate and share information. Web 2.0 was initially identified to distinguish between traditional static websites and interactive web platforms, where users exchange information and reconfigure existing knowledge simultaneously (Xin, Ramayah, Soto-Acosta, Popa & Ping, 2014). Research has analyzed the impact of the social web on knowledge management (KM), while others have directly coined the term KM 2.0 as the acquisition, creation and sharing of collective intelligence through social networks and communities of knowledge (Levy, 2009; Sigala & Chalkiti, 2013). The Web 2.0 constitutes an Internet-based digital platform that enables the creation of social networks, facilitating information dissemination and knowledge sharing (Joo & Normatov, 2013). Consequently, firms are deploying Web 2.0 technologies, such as social networking, wikis, and blogging to improve collaboration and Web 2.0 knowledge sharing within their boundaries (Lim, Trimi & Lee, 2010). In addition, although the literature suggests that the findings of studies examining KM practices in large companies are unlikely to be generalizable to SMEs, very few and recent studies focus on this specific type of firms (Chan, Chong & Zhou, 2012; Huy, Rowe, Truex & Huynh, 2012).

Research has demonstrated that, although firms have extensively adopted Internet technologies, technology use is an important link to business value and that such link is sometimes limited especially to small and medium-sized enterprises (SMEs) (Devaraj & Kohli, 2003; Zhu & Kraemer, 2005). Thus, implementing IT applications, by itself, is not enough to ensure a better outcome in terms of knowledge sharing. Knowledge will not necessarily circulate freely firm-wide just because accurate IT to support such circulation is available (Brown & Duguid, 2000). Therefore, it is important to understand the key factors

that facilitate and motivate Web 2.0 knowledge sharing in SMEs. Beyond technological and environmental factors, existing research has recognized the importance of organizational factors in influencing the adoption and use of Internet-based technologies (Gu, Cao & Duan, 2012). Organizational factors may constrain or facilitate the implementation and usage of Web 2.0 technologies for knowledge sharing. Organizations seeking consumer loyalty, such as Amazon, create an environment which is commitment-based (benefits to the consumers) and may affect the organizational social climate, since these practices influence the interactions, behaviors and motivation of their consumers. In contrast, measures to capture consumer commitment can exert performance pressure on the organization employees, which has been found to undermine knowledge sharing (Gardner, 2012).

In this sense, the literature suggests that knowledge is an important antecedent of innovation (Nonaka & Takeuchi, 1995; Templeton, Lewis & Snyder, 2002). Although there is research that has analyzed the relationship between KM and innovation (López-Nicolás & Meroño-Cerdán, 2011), little is known about whether and how different factors promote or hinder Web 2.0 knowledge sharing and on the effect of Web 2.0 knowledge sharing on innovation in SMEs. To delve into these questions, this paper develops an integrative conceptual model to assess the effect of different factors on Web 2.0 knowledge sharing and its effect on innovation in SMEs. In addition, this study analyses whether Web 2.0 knowledge sharing mediates the relationship between commitment-based consumer practices and innovation towards how organizations can practice knowledge sharing between consumers and employees to develop their power brands.

With this aim in mind, the rest of our study is organized as follows. The literature review and hypotheses are presented first, followed by the research methods drawing from a sample of 552 SMEs. Then, data analysis and results are ex-

amined and, finally, conclusions, limitations and future research guidelines are presented.

## 2. THEORETICAL BACKGROUND AND HYPOTHESES

### 2.1. Factors affecting Web 2.0 knowledge sharing

The technological context refers to the characteristics of the technological innovation, the organizational context describes characteristics of the organizations, and the environmental context implies characteristics of the environment in which the adopting organizations operate (Tornatzky & Fleischer, 1990; Thong, 1999). This framework has been considered in the literature as one of the main theoretical frameworks to analyze factors which affect the adoption and use of different ITs, including: electronic business (e.g. Bordonaba-Juste, Lucia-Palacios & Polo-Redondo, 2012; Xu, Zhu & Gibbs, 2004), electronic collaboration (Chan et al., 2012), mobile commerce (San Martín, López-Catalán & Ramón-Jerónimo, 2012), enterprise resource planning (Zhu, Li, Wang & Chen, 2010), electronic data interchange (Kuan & Chau, 2001), and information and open systems (e.g. Chau & Tam, 1997; Thong, 1999). Also, very recent studies specific to the adoption and use of Internet technologies have employed this theoretical approach (Bordonaba-Juste et al., 2012; Chan et al., 2012; Gu et al., 2012; San Martín et al., 2012). Thus, drawing upon the literature that analyzes Internet technologies adoption/use and the technology-organization-environment (TOE) framework, this paper proposes several hypotheses to investigate factors that influence Web 2.0 knowledge sharing in SMEs.

Web 2.0 knowledge sharing is expected to be influenced by firms' technology, since IT plays a pivotal role in supporting KM processes. Tangible IT resources, such as information systems integration, have been found significant in studies using the TOE framework (e.g. Zhu, Kraemer & Xu, 2006; Zhu & Kraemer, 2005). Information

systems integration in the e-business context is conceptualized as front-end integration and back-end integration (Zhu, Kraemer, Xu & Dedrick, 2004). Similarly, information systems integration may influence Web 2.0 knowledge sharing, since it enables efficient communication and collaboration. Regarding IT intangible resources, IT skills have been identified as one of the main factors that influence the level of e-business use (Bordonaba-Juste et al., 2012). Firms that employ IT professionals are more likely to adopt IT innovations because they can better adapt IT applications to their organizations and develop their own specific ones. Therefore, information systems integration and IT expertise may be important technological issues to explain Web 2.0 knowledge sharing.

Beyond technological factors, the TOE framework has acknowledged the importance of organizational factors in influencing Internet-based technologies adoption and use (Gu et al., 2012). Technology enablers are a necessary, but not a sufficient condition for consumers, as well as employees, to collaborate and share knowledge. It is essential to develop interaction networks that allow individuals to come together and collaborate through the network; knowledge creation and acquisition rarely occurs if individuals do not interact (Alavi & Leidner, 2001). Thus, building social climate may be crucial to motivating consumers and employees to work and share knowledge together (Valkokari, Paasi & Rantala, 2012). This is even more crucial when sharing tacit knowledge, which requires more interaction between employees and consumers (Fox, 2000). The literature distinguishes between transaction-based consumer practices, which focus on individual short-term exchange relationships, and commitment-based consumer practices, which emphasize mutual long-term exchange relationships among employees and consumers, suggesting that the latter may contribute to such a social climate (Tsui, Pearce & Porter, 1997). In fact, Collins and Smith (2006) found that, by creating certain social climate conditions, commitment-based consumer practices influence positively knowledge exchange.

Authors Tornatzky and Fleischer (1990) described the TOE framework considering the environmental context that influences the adoption and implementation of technological innovations with three aspects: technological context, organizational context, and environmental context. The technological context refers to the characteristics of the technological innovation, the organizational context describes the characteristics of organizations, and the environmental context implies the characteristics of the environment in which adopting organizations operate.

According to Thong (1999), competition is the business environment in which the business operates in a technology-organization-environment (TOE). It has been extensively used as the theoretical framework to analyze factors which affect the adoption and use of information and open systems.

Early studies on technology diffusion found that competition increases firms' incentives to adopt new technologies so as to remain competitive (Thong, 1999). Competition intensity is an important driver of Internet technologies adoption (Wang, Wang & Yang, 2010; Zhu, Kraemer & Xu, 2003; Zhu et al., 2006). Thus, the use of Internet technologies is less tied to competition intensity than initially thought in both large and small businesses. Too much competitive pressure lead firms to change rapidly from one technology to another without sufficient time to infuse the technology into the company (Zhu et al., 2006). Porter's (1985) five forces refers to horizontal competition (the threat of substitute products, the threat of existing rivals, and the threat of new entrants), and vertical competition (the bargaining power of suppliers). Thus, although competition encourage technology adoption, it is not necessarily good for technology use.

## 2.2. Knowledge management through innovation in creating power brands

A power brand identifies a company, product or service. It has high awareness and recall with customers and is associated with very success-

ful global companies. As per study of Interbrand (2007), a power brand is assessed through its brand weight, which is the influence or dominance that a brand has over its category or market; brand length, which is the stretch or extension that the brand has achieved in the past or is likely to achieve in the future (especially outside its original category); brand breadth, which is the breadth of franchise that the brand has achieved in terms of age spread, consumer types and international appeal; and brand depth, which is the degree of commitment that the brand has achieved among its customer base and beyond; it is the proximity, the intimacy and the loyalty felt for the brand. According to Keller (2007), when it comes to 'power brands', customers pay attention to the marketing communication as it moves people; it is exciting, aspirational, clearly communicated, unique, specific; it connotes superiority or domination, and is bold and brash. It causes people to want to invest in/work for the company or buy the company's products, thus making the product more transformational, revolutionary and not just evolutionary, hence allowing consumers to clearly identify and specify products which genuinely offer added value, allowing a stronger customer relationship leading to loyalty. Also, power brands drive social change in their favor. Keller and Kotler (2013) believe organizations must link business and brand strategy to create a unique and relevant brand identity with distinct positioning through consistent delivery of their brand contract and further practice. Effective global brand management thus plays important role in influencing brand associations and loyalty.

The main advantage of power brand strategy, as practiced by many organizations, is growth offered by high brand association as the final aim of any extension to new product category. Furthermore, marketing communication also plays a significant role in growth and development of brand association.

Through consistent knowledge sharing among consumers and employees, SMEs can deploy

power brand strategy within their organization to reap its benefits. Knowledge has been recognized as the main driver of new products, services and processes (Choy, Yew & Lin, 2006; Lopez-Cabrales, Pérez-Luño & Cabrera, 2009). Collaborative technologies and virtual spaces, where participants can share knowledge and information in real time, have been found to be positively related to innovation in SMEs (Meroño-Cerdán, Soto-Acosta & Lopez-Nicolas, 2008). Similarly, the Internet and web-based technologies can be used to share individual experience and innovation throughout the organization and offer the chance of applying such knowledge for the creation of products and/or services. Web-based technologies facilitate the implementation of innovation with users and partners from remote places. Thus, the benefits of such knowledge sharing, which include efficient information sharing and knowledge, as well as working with no distance limitations, are positively related to innovation.

### 2.3. Web 2.0 knowledge sharing and innovation: direct and mediated associations

Social exchange theory argues that consumers balance their level of commitment with the company's level of commitment to them (Wayne, Shore & Liden, 1997). Based on this, Eisenberger, Armeli, Rexwinkel, Lynch and Roades (2001) suggested that consumers con-

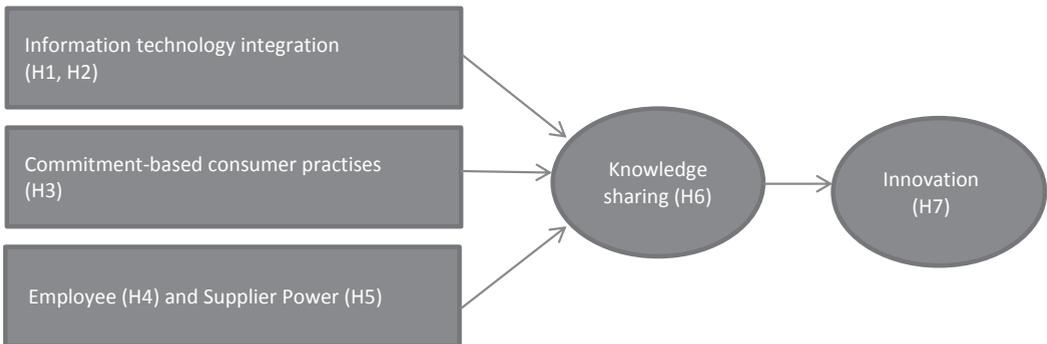
tribute to a firm's success in response to the rewards or care they receive from the organization. Commitment-based consumer practices may be considered as a kind of group incentives (Park & Kim, 2013; Peterson & Luthans, 2006). However, recent research found commitment-based consumer practices not to be directly related to innovation unless they take into consideration employees' knowledge (Lopez-Cabrales et al., 2009). Group incentive improves consumers' attitude toward organizational communication (Hanlon & Taylor, 1991). Thus, commitment-based consumer practices may affect innovation positively through Web 2.0 knowledge sharing. In other words, commitment-based consumer practices are expected to motivate consumers to work together and share knowledge through social networks; in turn, such strong climate for cooperation and knowledge sharing is expected to contribute to innovation. The set of relations is illustrated in Figure 1.

## 3. RESEARCH METHODOLOGY

### 3.1. Hypothesis

The literature clearly suggests that information systems integration works better with Web 2.0 knowledge sharing among various stakeholders (either employees within an organization or their customers). Knowledge sharing can lead

FIGURE 1



consumers to be more responsive to employees' comments and more critical, including in marketers' collection of personal information from consumers (Valkenburg & Peter, 2013). Hence, we pose the following hypothesis:

Hypothesis 1: Information systems integration is positively associated with Web 2.0 knowledge sharing.

Studies have demonstrated that restrictive IT expertise of consumers and employees is mandatory for a significantly positive association with organization Web 2.0 knowledge sharing.

Organizations are deploying cloud-based platforms to answer customer questions on topics such as products, orders, credit and account management before and after the purchase to measure knowledge-enabled consumer digital engagement. Accenture has named this move toward personalization "The Internet of Me" and highlights it, in its 2015 Technology Vision report, as one of five key trends. Thus, we propose the following hypothesis:

Hypothesis 2: Technology-organization-environment (TOE) within stakeholders is mandatory for a significantly positive association with organization Web 2.0 knowledge sharing.

Hypothesis 3: Consumer-based commitment practices are positively associated with Web 2.0 knowledge sharing.

We propose a model that uses TOE. It has been extensively used as the theoretical framework to analyze factors which affect the adoption and use of information and open systems to predict intentions to share knowledge and actual sharing behavior in organizations. This model is compatible with previous models of knowledge sharing, such as Kelloway and Barling's (2000) model of knowledge use in organizations, and Gottschalg and Zollo's (2007) interest alignment model. The major differences lie in conceptualizing motivation, which is now multidimensional, and in including psychological factors that influence the quality of motivation. The Model I presented explains in-depth how and why spe-

cific HRM practices will influence people's engagement in knowledge-sharing behavior, and thus provides concrete advice to practitioners and organizations:

Hypothesis 4: Web 2.0 knowledge sharing within organization is significantly positively related to employee motivation.

Vertical integration refers to a strategy where a company expands its business operations into different steps on the same production path, such as when a manufacturer owns its supplier and/or distributor (Hortaçsu & Syverson, 2007).

Williamson (2010) suggests a related but distinct set of inefficiencies inside organizations. These include low-powered incentives, and rent-seeking and informational bottlenecks that arise in managerial hierarchies. An implicit assumption in transaction cost theory is that these problems are relatively insensitive to the complexity, uncertainty, or specificity of particular transactions. Thus, we propose:

Hypothesis 5: Vertical competition from suppliers is negatively related to Web 2.0 knowledge sharing.

Although the literature on Web 2.0 knowledge sharing strongly suggests that innovation within organizations is an outcome of stakeholders (customers and employees) voluntary positive socialization, little is known regarding the impact of Web 2.0 knowledge sharing for developing power brands.

However, to the best of our knowledge, no study has examined the role of Web 2.0 knowledge sharing as positively associated with organizational innovation for the purpose of developing power brands in the context of information disclosing behaviors.

Hypothesis 6: Web 2.0 knowledge sharing is positively associated with organizational innovation for developing power brands.

In addition, we tested a more comprehensive model to integrate commitment-based con-

sumer practices and organizational innovation. These findings support previous research suggesting that knowledge sharing is an antecedent of innovation (e.g. Capon, Farley, Hulbert & Lehmann, 1992; Griffin & Hauser, 1996), as well as studies suggesting that Internet technologies used (including knowledge sharing) are related to innovation (Meroño-Cerdán et al., 2008). We therefore propose that:

Hypothesis 7: Web 2.0 knowledge sharing mediates the relationship between commitment-based consumer practices and organizational innovation.

### 3.2. Data collection and sample

The target population of our study consists of SMEs from Spain. To ensure a minimum firm complexity, only firms with at least 15 employees were used. Data collection was done in two stages: a pilot study and a questionnaire were conducted. Five SMEs were randomly selected from a database to pretest the questionnaires. Based on their responses and subsequent interviews, minor modifications and calculations were made to the questionnaire. Hence, responses from these five pilot-study firms were not included in the final sample.

The population considered in this study is a set of all Spanish enterprises with at least 15 employees and having as their primary business activity: manufacturing, services, commerce, and construction. A total of 2246 employees were identified for participation. The survey was administered by managers of the companies via a personal interview, and the company itself was the unit of analysis for this study. In total, 550 valid questionnaires were analyzed, giving a 24.6-percent response rate. Potential bias in terms of non-response in the dataset was examined by comparing the characteristics of early and late participants. In terms of general characteristic and model variables, these comparisons did not reveal significant differences, suggesting that there is no cause for any survey bias.

TABLE 1: Profile of respondents (N= 552)

| Profile of respondents | Percentage |
|------------------------|------------|
| Industry               |            |
| Manufacturing          | 32.06%     |
| Commerce               | 25.00%     |
| Services               | 19.38%     |
| Construction           | 23.55%     |
| Number of employees    |            |
| 15-49                  | 71.73%     |
| 50-249                 | 28.27%     |

### 3.3. Measures

Most researchers agree that common method variance is a potentially serious bias threat in behavioral research, especially with single informant surveys. Several procedures were used to empirically determine interpretation of our results:

- the Harman one-factor test,
- the common latent factor approach,
- the confirmatory factor-analytic approach to the Harman one-factor test.

The rationale behind the Harman one-factor test is that the common method bias poses a threat to the analysis and interpretation of the data; a general factor would account for the majority of the covariance or a single latent factor and would account for all manifest variables. In the one-factor model obtained in our case, the principal components analysis revealed several factors in the factor solution.

However, confirmatory factor analysis (CFA) is considered as a sophisticated test. According to the one-factor model  $\alpha\chi^2 = 548.63$  with 65 degrees of freedom (compared to  $\chi^2 = 64.40$  with 55 degrees of freedom for the measurement model). However, there are several limitations to these procedures. Therefore, additional statistical remedies are recommended for this purpose. The common latent factor approach yielded  $\alpha\chi^2 = 145.43$  with 55 degrees of freedom (compared to  $\chi^2 = 64.40$  with 55 degrees of freedom for the measurement model).

CFA is used to analyze the constructs. On the basis of CFA assessment, the measurement models were more refined and fitted again. Constructs in the measurement model are discussed below. In order to facilitate cumulative research, operationalizations tested by various studies were used. A 5-point Likert scale was used to measure the anchors from strongly disagree (1) to strongly agree (5).

Several variables were operationalized as multi-item constructs. *Information systems integration* assessed the extent to which internal information systems and databases are connected, and the extent to which company information systems are linked to business partners' databases and systems. Items for technology integration are based on Zhu et al. (2006). *Commitment-based consumer practices* were operationalized based on Delery and Doty (1996), and Youndt, Snell, Dean and Lepak (1996). Overall, 8 items were adapted to measure commitment-based consumer practices: selection policies, and training

and development policies for long-term growth and team building. *Web 2.0 knowledge sharing* measured the extent of use of Web 2.0 technologies for sharing collective knowledge between employees and consumers.

The Web 2.0 knowledge sharing scale is based on Soto-Acosta and Meroño-Cerdan (2006), and Meroño-Cerdán and others (2008).

Based on previous IT literature, *IT expertise* was measured by the number of IT professionals (Bordonaba-Juste et al., 2012; Zhu & Kraemer, 2005; Zhu et al., 2004). *Vertical competition* was measured following two of Porter's (1985) concepts of five competitive forces. Such operationalization has previously also been used in the IT literature (Thong, 1999; Zhu et al., 2004).

### 3.4. Instrument validation

The unidimensionality and reliability of the dataset was assessed by different procedures. First of all, an initial exploration of unidimen-

TABLE 2: Measurement model

| Construct                              | Indicators | S. Loadings        | Reliability             |
|--|------------|--------------------|-------------------------|
| <i>Information systems integration</i> | TI1        | 0.819 <sup>a</sup> | CR = 0.78<br>AVE = 0.64 |
|  | TI2        | 0.782***           |                         |
| <i>IT expertise</i>                    | ITP        | n/a                | n/a                     |
| <i>CBSP</i>                            | CONSUMER1  | 0.835 <sup>a</sup> | CR = 0.82<br>AVE = 0.60 |
|  | CONSUMER2  | 0.720***           |                         |
| <i>CBTDP</i>                           | CONSUMER3  | 0.789 <sup>a</sup> | CR = 0.76<br>AVE = 0.61 |
|  | CONSUMER4  | 0.884***           |                         |
|  | CONSUMER5  | 0.640***           |                         |
| <i>Employee</i>                        | VCC        | 0.745              | CR=0.74<br>AVE=0.62     |
| <i>Vertical competition (supplier)</i> | VCS        | n/a                | n/a                     |
| <i>Web 2.0 knowledge sharing</i>       | WKS1       | 0.852 <sup>a</sup> | CR = 0.84<br>AVE = 0.63 |
|  | WKS2       | 0.775***           |                         |
|  | WKS3       | 0.753***           |                         |
| <i>Organizational innovation</i>       | OI1        | 0.872 <sup>a</sup> | CR = 0.84<br>AVE = 0.64 |
|  | OI2        | 0.815***           |                         |
|  | OI3        | 0.713***           |                         |

Fit statistics for the measurement model:  $\chi^2(55) = 64.40$ ; CFI = 0.98; IFI = 0.98; GFI = 0.96; RMSEA = 0.033.

<sup>a</sup>Fixed items in the scale; \*\*\* p<0.01; CR: Composite reliability; AVE: Average variance extracted;

n/a: Loadings, CR and AVE are not applicable to single-item constructs.

sionality was done using principal component factor analysis. In each analysis, the eigenvalues were greater than 1, lending preliminary support to a claim of unidimensionality in the constructs. Following that, CFA was performed via the EQS 6.2 statistical software to assess the unidimensionality of each construct. In this sense, construct reliability, convergent and discriminant validity were assessed. The measurement model presented a good fit to the data ( $\chi^2$  (55) = 64.40; CFI = 0.98; IFI = 0.98; GFI = 0.96; RMSEA = 0.033). All traditionally reported fit indexes were within the acceptable range. The commitment-based consumer practices as a single construct made up of two dimensions on the basis of study: commitment-based selection policies (CBSP) and commitment-based training and development policies (CBTDP). A second-order factor analysis shows that the two dimensions reflect the higher order constructs ( $\chi^2$  (3) = 6.701; CFI = 0.99; IFI = 0.99; GFI = 0.99; RMSEA = 0.04).

Construct reliability analysis focuses on the degree or amount to which items are free from random error and, hence, yield consistent results.

For assessing the discriminant validity – the extent to which different constructs diverge from each other, the square root of average variance should be greater than the absolute value of inter-construct correlations. All constructs met this criterion which suggests that the items share a larger variance with their constructs than with other constructs.

## 4. EMPIRICAL RESULTS

The relationship between information systems integration and Web 2.0 knowledge sharing was not statistically significant, indicating that information systems integration is not related to Web 2.0 knowledge sharing in SMEs. Since the relationship between IT expertise and Web 2.0 knowledge sharing was positive and statistically significant (0.10,  $p < 0.05$ ), this result shows that hiring specialized IT personnel in the firm is an important factor for Web 2.0 knowledge sharing. The relationship between commit-

ment-based consumer practices and Web 2.0 knowledge sharing was positive and statistically significant (0.81,  $p < 0.01$ ), making commitment-based consumer practices the strongest path in the proposed model. This indicates that the presence of commitment-based consumer practices is a critical factor driving Web 2.0 knowledge sharing in SMEs. The relationship with Web 2.0 knowledge sharing within organization, as significantly positively related to employee motivation, was found statistically significant (0.21,  $p < 0.05$ ).

The relationship of Web 2.0 knowledge sharing with vertical competition with suppliers is not considered significant. In addition, results show that Web 2.0 knowledge sharing contributes positively to innovation (0.49,  $p < 0.01$ ).

Finally, as shown in Table 3, the indirect effect of commitment-based consumer practices on innovation through Web 2.0 knowledge sharing was positive and significant (0.40,  $p < 0.01$ ), supporting the mediating effect of Web 2.0 knowledge sharing in the relationship between commitment-based consumer practices and innovation. Implications of these results are discussed in the next section. This study found support for hypotheses H2, H3, H4, H6 and H7, whereas it did not find support for hypotheses H1 and H5.

TABLE 3: Direct and indirect effects

| Direct Effect                     |         |
|-----------------------------------|---------|
| C-B CONSUMER practices Web 2.0 KS | 0.81*** |
| Web 2.0 KS Innovation             | 0.49**  |
| Indirect Effect                   |         |
| C-B CONSUMER practices Innovation | 0.40*** |

Note:  $p < 0.01$ \*\*\*

## 5. DISCUSSION

The empirical results have shown that factors have different effects on Web 2.0 knowledge sharing. Within the technological context, results showed IT expertise to be positively as-

sociated with Web 2.0 knowledge sharing (Hypothesis 1: Information systems integration is positively associated with Web 2.0 knowledge sharing). The finding confirms recent research (Bordonaba-Juste et al., 2012), which found IT expertise to be among the main factors that affect the extent of e-business use.

While a non-significant relationship was found for the relationship between technology integration and Web 2.0 knowledge sharing (Hypothesis 2: Technology-organization-environment (TOE) within stakeholders is mandatory for a significantly positive association with organization Web 2.0 knowledge sharing.). The second finding counters existing research analyzing Internet technologies (e.g. Zhu et al., 2006; Zhu & Kraemer, 2005), which found technology integration to be positively related to the extent of e-business use (Zhu et al., 2006) and positively associated to e-business value (Zhu & Kraemer, 2005). A possible explanation for this can be that previous studies have focused on aggregate measures of the organizational adoption and use of Internet technologies and, within that context, tangible IT assets such as technology integration may be more crucial. And quite the opposite is true within the specific context of SMEs.

Taking the organizational context, the effect of commitment-based consumer practices and Web knowledge sharing is analyzed (Hypothesis 3: Consumer-based commitment practices are positively associated with Web 2.0 knowledge sharing). Results showed a positive relationship between these two constructs, since commitment-based consumer practices is the strongest factor in our proposed model. These findings support previous studies (Collin & Smith, 2006) which found commitment-based consumer practices to be very strongly related to knowledge and idea exchange. Hence, SMEs should focus on commitment-based consumer practices, rather than on transaction-based consumer practices.

The results regarding factors from the employee context (Hypothesis 4: Web 2.0 knowledge sharing within organization is significantly positively related to employee motivation) suggest that a

positive relationship exists between employee motivation and Web 2.0 knowledge sharing.

The results regarding factors from the environmental context (Hypothesis 5: Vertical competition from suppliers is negatively related to Web 2.0 knowledge sharing) show a non-significant relationship between supplier power and Web 2.0 knowledge sharing. These findings partially support recent research (Chan et al., 2012; Zhu et al., 2006), which found that competition may deter firms from using Internet technologies. Thus, although external pressure from suppliers affects e-business adoption (Del Aguila-Obra & Padilla-Melendez, 2008; Wang & Ahmed, 2009), competition is not necessarily good for technology use. Too much competitive pressure leads firms to change rapidly from one technology to another without sufficient time to use the technology (Zhu et al., 2004; Zhu et al., 2006). Our findings also confirm previous research using SMEs.

Furthermore, the results of our research suggest a positive relationship between Web knowledge sharing and innovation (Hypothesis 6: Web 2.0 knowledge sharing is positively associated with organizational innovation for creating power brands and Hypothesis 7: Web 2.0 knowledge sharing mediates the relationship between commitment-based consumer practices and organizational innovation). The inputs of knowledge sharing between consumers and employees helps an organization's innovative power brands; as a concept in brand management, this is practiced as corporate strategy in most organizations with a considerable portfolio of product lines, thus creating a potential market share compared to their competitors as the brand enjoys a leading position in more than one product category.

Therefore, although the literature suggests that innovation cannot be easily split into separate phases or stages, innovation does not neatly proceed in a linear fashion (Anderson, De Dreu & Nijstad, 2004). In addition, our results support the mediating effect of Web 2.0 knowledge sharing in the relationship between commitment-based consumer practices and innovation. This finding confirms previous research,

which found that consumer practices are not directly related to innovation unless they take into consideration employees' knowledge (Lopez-Cabrales et al., 2009). Thus, commitment-based consumer practices are expected to motivate employees to work together and share knowledge through social networks and such strong climate of cooperation and knowledge sharing is expected to contribute, by extension, to innovation.

This paper outlines the impact of Web 2-specific KM solutions, processes and technology on SMEs, as a base for enlargement and change, in order to ease knowledge needs of consumers and employees. The Web 2.0 tools enable SMEs to quickly deploy innovation within the organization by assimilating knowledge inputs from employees and consumers. This is congruent with the findings of Levy (2009), citing Solobak (2007) as claiming that "just as with knowledge management, WEB 2.0 tools don't attract [customers] because they exist" but because they create a kind of 'emotional investment' in the work that will make use of these applications.

Consumers need to have a reason to use them, with trust, interest, and participation needed to make them usable. "Particularly in the case of 'the power of networks' view of WEB 2.0: there needs to be a network of people participating" (Levy, 2009 - citing Solobak, 2007).

## 6. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

The literature considers KM as a set of practices including: knowledge acquisition/creation, knowledge dissemination, and knowledge utilization (Darroch, 2003; Jayasingam, Ansari, Ramayah & Jantan, 2013; Tiwana, 2003). These practices share the use of knowledge as the crucial factor to add and generate value (Alavi & Leidner, 2001; Pérez-López & Alegre, 2012). However, to generate or transfer knowledge, interaction has to take place between the main players.

In this sense, knowledge generation and sharing is considered as essential to achieving the desired goals and objectives of KM practices (Valkokari et al., 2012). Therefore, an organization's survival and growth are considered to depend upon the working efforts plus the interactions among the employees, consumers as they work hard and create knowledge to transform novel ideas into innovations. Today, firms are using Web 2.0 technologies in order to enhance knowledge sharing and collaboration (Sigala & Chalkiti, 2013). Thus, it is becoming essential for firms to assimilate Web 2.0 technologies to supply information and share knowledge among them. Although various studies have advanced our understanding of the subject, they are mainly focused on large businesses, with comparatively few recent studies analyzing SMEs (Chan et al., 2012). This study shed some light on the factors that affect Web 2.0 knowledge sharing and its effect on innovation in SMEs. The study also investigates whether Web 2.0 knowledge sharing mediates the relationship between consumer practices and innovation. Its results suggest that organizational factors – commitment-based consumer practices – are the main drivers of Web 2.0 knowledge sharing and that it mediates the relationship between consumer practices and innovation in SMEs. These findings suggest that firms must pay attention to different factors in order to enhance Web 2.0 knowledge sharing and that commitment-based consumer practices create a context that enhances Web 2.0 knowledge sharing which, in turn, leads to new knowledge and innovation.

At the dawn of a very new era involving the widespread usage of artificial intelligence and the so-called semantic web (or Web 3), companies (SMEs) are still struggling with the adoption of IT solutions based on Web 2.0 technology. The enormous opportunities are omnipresent, but the multi-layered problems of system adoption are omnipresent; this paper highlights the importance of information system adoption and innovation to sustain completion. More importantly, a number of managerial implications can be derived from these findings; it is highly

recommended for top management in SMEs to take an active leadership role in introducing Web 2.0 technologies, communicating their benefits, and articulating how they fit into the organization's knowledge management strategy and, ul-

timately, how they could help achieve organizational objectives. Organizations must strengthen their consumer participation through social media tools, communities, and blogs, thus encouraging active participation from clients.

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## APPENDIX

### Measures

#### Information systems integration

- o Extent to which internal enterprise information systems and databases are integrated (1-5)
- o Extent to which enterprise information systems and databases are integrated with those of business partners (clients, suppliers...) (1-5)

#### IT expertise

- o Number of IT professionals (#)

#### Commitment-based consumer practices

- o Our selection system focuses on the potential of the candidate to learn and grow (1-5)
- o Internal candidates are considered over external candidates for job openings (1-5)
- o Selection processes are formalized and rigorous (1-5)
- o Our company provides career path opportunities (1-5)
- o Our company supports employees willing to take further training (1-5)
- o Promotion is based on objective criteria (seniority, objectives...) (1-5)
- o Performance appraisals are used to plan skill development and training (1-5)

- o Job rotation is used to expand the skills of employees and team building

#### Vertical competition (customers and suppliers)

- o Pressure clients exert on purchasing conditions (1-5)
- o Pressure suppliers exert on purchasing conditions (1-5)

#### Web 2.0 knowledge sharing

- o Extent to which the employees participate in organizational electronic discussion forums (1-5)
- o Extent to which Web 2.0 technologies are used for building collective knowledge (1-5)
- o Extent to which the employees upload information on organizational social networks or wikis (1-5)

#### Organizational innovation

- o The number of new or improved products/services launched to the market is above the average of your industry (1-5)
- o The number of new or improved processes is above the average of your industry (1-5)
- o Changes introduced in products and services during the last five years are very important (1-5)

Note: (1-5): five-point Likert-type scale; (#): continuous variable.