

# Linking knowledge management processes to innovation

## A mixed-method and cross-national approach

Eduardo Kunzel Teixeira

*Postgraduate Program in Regional Development,  
Universidade de Santa Cruz do Sul, Santa Cruz, Brazil*

Mirian Oliveira

*Faculty of Business, Accounting and Economics,  
Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil, and*

Carla Curado

*Higher Institute of Economics and Management, Universidade de Lisboa,  
Lisbon, Portugal*

332

Received 17 October 2018  
Revised 26 February 2019  
7 August 2019  
Accepted 3 September 2019

### Abstract

**Purpose** – This paper aims to analyse the relationship between knowledge management processes and innovation (KM-IN) in Brazilian and Portuguese companies.

**Design/methodology/approach** – The tests were performed using a sequential mixed-method approach. Quantitative analysis was conducted using 341 observations from Brazilian and Portuguese companies and partial least squares techniques. Qualitative analysis was conducted using ten interviews and content analysis techniques.

**Findings** – Results showed differences between Brazilian and Portuguese companies with respect to the relationship between knowledge sharing process and innovation. Portuguese companies cope with the geographical dispersal of operations and the lack of interpersonal skills by introducing formal knowledge sharing processes.

**Practical implications** – Findings demonstrate that the transfer of knowledge processes to foreign countries may demand adjustments according to cultural traits. Specifically, the findings will be of interest to firms intending to expand their activities between Brazil and Portugal.

**Originality/value** – Although researchers have investigated the influence of the national context in many countries, country comparisons are still scarce.

**Keywords** Innovation, Brazil, Knowledge management processes, Portugal, Knowledge and innovation management, Mixed-methods, Country comparison

**Paper type** Research paper



### Introduction

A number of empirical studies have investigated the relationship between knowledge management and innovation (KM-IN) (Abro *et al.*, 2009; Obeidat *et al.*, 2016; Yusr *et al.*, 2017; Dzenopoljac *et al.*, 2018; Turulja and Bajgorić, 2018). In addition to shedding light on the

---

The authors are grateful for the support provided by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES – Brazil – finance code 001), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) (Brazil) and Fundação para a Ciência e Tecnologia (FCT, Portugal, project UID/SOC/04521/2013).

direct relationship, empirical investigations have tested how contextual factors (Darroch, 2005; Migdadi *et al.*, 2017; Obeidat *et al.*, 2016) and antecedents (Hsu and Sabherwal, 2012; Mageswari *et al.*, 2017; Yusr *et al.*, 2017), moderators (Chen *et al.*, 2010) and mediators (Alegre *et al.*, 2013; Costa and Monteiro, 2016; Shujahat *et al.*, 2019) influence KM-IN.

One variable extensively controlled in KM-IN research is country. Country is controlled based on the premise that national culture influences the behaviour of persons, groups, and entities (Darroch, 2005). Hence, to name but a few, papers have investigated the KM-IN relationship using data from Iran (Shahraki and Keshtegar, 2016), United Kingdom (Abro *et al.*, 2009), France (Alegre *et al.*, 2013), Pakistan (Hassan and Raziq, 2019), Portugal (Costa and Monteiro, 2016), Spain (Fidel *et al.*, 2016), Germany (Pawlowsky and Schmid, 2012), Jordan (Migdadi *et al.*, 2017; Obeidat *et al.*, 2016), Taiwan (Chen and Huang, 2009; Hsu and Sabherwal, 2012), India (Mageswari *et al.*, 2017), Malaysia (Yusr *et al.*, 2017) and New Zealand (Darroch, 2005).

Although researchers have investigated the influence of the national context in many countries, to the best of our knowledge, none have attempted to compare the effects of specific national differences between countries with regard KM-IN. While, empirical studies have demonstrated that changes within national contexts affect knowledge management (KM) and innovation (Magnier-Watanabe and Senoo, 2010) and attempted to explain cross-cultural knowledge transfers (Bhagat *et al.*, 2002), country comparisons are still scarce.

Country comparisons are an important research subject because people from different nationalities respond differently to different contexts and stimuli, which means that such elements as hierarchical structures, processes and work styles may need adjustment when being transferred from one country to another. The lack of proper analysis of cultural contexts may undermine the potential of KM (Javidan *et al.*, 2005). This paper aims to help fill this gap by assessing the KM-IN relationship in two different countries.

In this paper, KM refers to the array of processes which foster knowledge within organizations. Innovation concept was centered in organizational innovation, which has been widely used in KM research (Allameh *et al.*, 2017; Simao and Franco, 2018) and is related to changes in organizational activities focused on cost reduction and improved productivity (OECD, 2005).

We chose to compare Brazil and Portugal because, while there are economic differences (the former is a developing country and the latter is a developed country), they share cultural similarities. Although the comparison of very distinct cultures seems more reasonable, comparing similar cultures is capable to reveal underestimated details. For example, based on assumptions of similar national cultures, multinationals may conduce careless adaptation plans. As claimed by Strese *et al.* (2016, p. 1164) “when implementing knowledge into new processes or products, a firm’s top management only needs to balance the specifics of corporate and national culture in selected circumstances”. Accordingly, our paper attempts to shed light on the subtle differences in how knowledge management processes affect innovation considering countries with similar cultural mindsets.

The tests were performed using a sequential mixed-method approach. First, KM-IN was analysed quantitatively using sample data from Brazilian and Portuguese companies (223 and 118, respectively). Second, to provide explanations for the quantitative results of that country comparison, a qualitative investigation was conducted using ten interviews. The quantitative results showed differences between Brazilian and Portuguese companies with respect to the relationship between knowledge sharing and innovation. The qualitative results reveal that problems arising from the geographical dispersal of operations and the lack of interpersonal skills can be compensated by introducing formal knowledge sharing processes and IT technologies.

From an academic perspective, this research contributes by showing that national context may influence the effects of KM on innovation. Equally, the findings also have managerial implications, as they demonstrate that the transfer of knowledge processes to foreign countries may demand adjustments according to cultural traits. Specifically, the findings will be of interest to firms intending to expand their activities between Brazil and Portugal. Despite several works had approached the relationship between knowledge management and innovation, studies which explain such relationship in emerging economies such as Brazil are relatively scarce (Dzenopoljac *et al.*, 2018; Turulja and Bajgorić, 2018). Besides showing a cross country comparison, this research also contributes to knowledge related to how knowledge management relates to innovation in developing countries. The article is divided into six sections. After this introduction, the second section presents the theoretical framework. The third section describes the methodological procedures. Fourth and Fifth sections analyses and discuss the results, respectively. Lastly, the conclusions section offers the conclusions.

### Theoretical background and hypothesis

#### *Knowledge management processes foster innovation*

KM is the management function that deals with knowledge (Abro *et al.*, 2009) and is recognized as an arrangement of processes that facilitates innovation (Gurteen, 1998). Innovative organizations are those with the ability to use their knowledge resources, consequently, KM can be seen to be critical to innovation (Alegre *et al.*, 2013; Chen and Huang, 2009; Darroch, 2005; Obeidat *et al.*, 2016). As pointed by Martinez-Costa *et al.* (2019, p. 1), “companies immersed in these innovation processes should look for organisational responses that facilitate the capture of ideas and the introduction of changes in the organisation”.

Based on reviews of the available literature, the KM concept can be fully described using from three to five processes (Anand and Singh, 2011; Heisig, 2009). In fact, several of those processes differ only slightly (Anand and Singh, 2011; Andreeva and Kianto, 2011). This research adopts Anand and Singh's (2011) four-process model to describe KM, using the nomenclature acquisition, storage, sharing and application to describe the main KM processes.

Knowledge acquisition processes (ACQUI) are intended to obtain useful knowledge by creating it or absorbing it from internal/external sources (Gold *et al.*, 2001; Hassan and Raziq, 2019). Companies acquire knowledge from internal and external sources by hiring new people, and from organizational relationships, social networks and training and R&D initiatives (Rusly *et al.*, 2012). The whole process is designed to include new knowledge within the firm's knowledge base. When an organization absorbs new knowledge it can enhance mental models (Aranda and Molina-Fernandez, 2002; Turulja and Bajgorić, 2018) and promote better adaptations to market conditions (Martinez-Canas *et al.*, 2012). ACQUI can produce positive effects on innovation because by acquiring new knowledge firms are better able to adapt to changes (Dahiyat, 2015).

Knowledge storage processes (STORE) are designed to facilitate the retention and manipulation of knowledge (Alavi and Leidner, 2001; Donate and Guadamillas, 2010). Firms establish STORE to keep a memory of lessons learned, deal with problems of content fragmentation, inconsistency and redundancy and speed up content access and transfer (Alegre *et al.*, 2013). STORE combine activities through which firms formalize the knowledge to be accessed by all staff. It is often necessary to adapt the knowledge before it can be distributed and made available throughout the whole firm (Dahiyat, 2015). STORE is positively related to innovation because it helps maintain the integrity of knowledge over

time, thus facilitating rapid access to that knowledge in the present and future (Bermejo *et al.*, 2016). A well-structured knowledge storage system allows a firm to simultaneously handle large volumes of knowledge, thus allowing it to come up with faster and more complex responses.

Knowledge sharing processes (SHARE) are intended to permit the mutual exchange of knowledge between individuals, which generates new knowledge (Kamasak and Bulutlar, 2010; Obeidat *et al.*, 2016). Such processes are considered central in leveraging knowledge assets (Singh, 2018), as they make it easy for firm members to donate and collect knowledge, facilitating synergies, collective learning, innovation, the creation of shared values and standards (Chen *et al.*, 2010). SHARE are made manifest when individuals engage in knowledge collection and donation, which results in synergies among people, which in turn enhance creativity and eliminate redundancy (Kamasak and Bulutlar, 2010; Tassabehji *et al.*, 2019). Hence, individuals bring into and share within the organization their external experiences, thus accelerating innovation (Dahiyat, 2015).

Knowledge application processes (APPLY) are intended to guide and organize the practical use of knowledge (Gold *et al.*, 2001), adjust strategic directions and cope with new challenges (Turulja and Bajgorić, 2018). In individuals, these processes foster the mastery of knowledge by ensuring it is worked with in different situations (Mehrabani and Shajari, 2012). Establishing such practices provides the opportunity to repeat activities, which helps individuals improve efficiency, efficacy and agility when fulfilling their tasks (Hsu and Sabherwal, 2011). APPLY help staff incorporate relevant knowledge and become proficient in at applying it (Overall, 2015), which expands current possibilities and the perception of potentialities to organizations. By contrast, firms that fail to apply knowledge are less likely to translate knowledge into innovation (Dahiyat, 2015).

In summary, each KM process is expected to replicate the general statement that KM is positively related to innovation. As a general model hypothesis:

- H1. ACQUI is positively related to innovation.
- H2. STORE is positively related to innovation.
- H3. SHARE is positively related to innovation.
- H4. APPLY is positively related to innovation.

#### *The effect of national culture on knowledge management and innovation*

Culture represents “shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives and are transmitted across age generations” (House *et al.*, 2004, p. 15). Cultural distances may induce alienation and resistance towards those who are culturally different (Javidan *et al.*, 2005). “It is not easy for one to understand and accept practices and values that vary from one’s own personal experiences” (House *et al.*, 2004, p. 5).

As each person participates in many groups, and each group can develop its own culture, each person is influenced simultaneously by several layers or types of culture (Hofstede *et al.*, 2010). The national layer of culture is forged by shared norms, values, and other features that influence individual behaviours and mind sets (House *et al.*, 2004). Given that people are exposed to their national culture from a very young age (when they are more sensitive to influences) and that influence persists for many years, national culture can be expected to predominate in any conflict with other cultural levels (Hofstede *et al.*, 2010). When there is a clash between corporate and national cultures, for example, national culture

prevails because “employees and managers bring their cultural background and ethnicity to the workplace” (Adler and Gundersen, 2007, p. 63).

Since 1980, the dimensional approach to culture has become the dominant paradigm, and many papers have suggested national culture should be seen as a multidimensional construct (Hofstede *et al.*, 2010). Two of the most widely acknowledged studies, those of Geert Hofstede (Hofstede *et al.*, 2010) and the Global Leadership and Organizational Behaviour Effectiveness (GLOBE) (House *et al.*, 2004), maintain a correspondence between the dimensions of national culture (Cagliano *et al.*, 2011). Although several models have been available, Hofstede’s model can be considered the dominant approach regarding national cultures because “most research on national culture uses them (i.e. his dimensions) in some way. Even those researchers who offer alternative measurement scales, compare theirs to his” (King, 2008, p. 37).

Each dimension of national culture may influence both KM and Innovation. The influence of national culture on KM implies the effect of the latter may be conditioned by both organizational explicit procedures and guidelines, and individual mental models drawn from national culture (Magnier-Watanabe and Senoo, 2010). National culture influences the way that people in society think, how they view their duties, collect information, respond to others and express their feelings. Hence, it is reasonable to assume that national culture would influence the way KM is conducted, how KM outputs are valued and used and the overall success of KM. It is conceivable that if national cultural norms are contrary to established organizational norms – such as might be the case for employees of a foreign-based firm – the organizational culture might dominate in the short-run, but this dominance is unlikely to keep in the long-run because national culture is sturdy and enduring. In any case, national culture is likely to dominate regarding private behaviours (King, 2008). The influence of national culture has been studied in the context of innovation, where it has been demonstrated that low power-distance and uncertainty avoidance and high masculinity and individualism can foster higher innovation (Couto and Vieira, 2004; Shane, 1993). Similar effects have been found in the management of large scientific projects (Shore and Cross, 2005), in group support systems (Reinig and Mejias, 2004), in consumer behaviour and in product diffusion (King, 2008).

Power distance (PD) reflects the degree of complacency regarding inequalities among individuals in societies (Hofstede *et al.*, 2010; House *et al.*, 2004). A wide PD is associated with strong hierarchies, vertical communication patterns, centralized power, control over subordinates, and resistance to change in the distribution of power, all of which are thought to hinder innovation (Shane, 1993). For example, workers in wide PD societies rarely participate of decision-making processes, which may constrain the willingness of the individual to try new things (Cagliano *et al.*, 2011). By contrast, a narrow PD is characterized by a more equitable distribution of power and rights, which are generally desired and praised (Saffu, 2003). Accordingly, a narrow power distance is related to innovation (Dunphy and Herbig, 1994; Singh, 2006).

Uncertainty avoidance (UA) is positively related to the formalization of rules, which, at high (low) levels, can be negative (positive) to innovation (Cagliano *et al.*, 2011; Dunphy and Herbig, 1994; Singh, 2006). UA refers to how a culture manages the fact the future is uncertain (Hofstede *et al.*, 2010) and is reflected in the extent to which ambiguous situations are tolerated and the extent to which institutions insist on conformity. “In high uncertainty avoidance countries, people tend to show more nervous energy, while in countries which are have low UA, people are more easy going” (Hofstede, 1980, p. 90). In general, individuals in low UA cultures are inherently less anxious about taking risks than those in high UA cultures (Saffu, 2003; Singh, 2006).

Individualistic societies award the individual considerable freedom of choice and in such societies decision-making and personal initiative is not merely accepted but encouraged with great importance being placed on personal goals and achievements (Singh, 2006). Individualism is associated with an emphasis on personal contribution (Cagliano *et al.*, 2011), which may foster a predisposition towards initiating new behaviour. By contrast, collectivist societies tend to breed conformity to the existing norms (Singh, 2006). The more individuals are free to explore new ideas and express themselves, the greater the likelihood of new ideas come into being (Dunphy and Herbig, 1994). Personal goals hold precedence over group goals and self-interest or the interest of immediate family is paramount (Saffu, 2003). Conversely, collectivist cultures tend to focus on out-group interests, affiliation and collective goals (Saffu, 2003).

More masculine societies are expected to place an emphasis on wealth, achievement, success, etc. which might be indirectly reflected in individual material possessions, which may be related to being more curious and prone to innovate (Singh, 2006). Masculinity implies a general toughness and competitiveness among the members of the society. It is the degree to which achievement and aggression are valued (Hofstede, 1980). Masculine cultures are distinguished by their assertiveness which is part of the early developmental process. In feminine cultures, assertiveness is not encouraged because of its dysfunctional effect (Saffu, 2003).

## Methods

The research involves sequentially applied quantitative and qualitative procedures. The sequential mixed-methods approach was chosen to improve explanations of possible deviations from what would be expected according to theory.

### *Quantitative procedures, measures and data*

The quantitative procedures follow the standard partial least squares (PLS) recommendations to assess the measurement and structural model (Hair *et al.*, 2014; Sanchez, 2013). The country comparison was performed using the bootstrap *t*-test procedure (Sanchez, 2013). Operational procedures were performed using R (R Core Team, 2016) and Rstudio (RStudio Team, 2015) software.

All constructs were measured using seven-likert type scales ranging from 1 (strongly disagree) to 7 (strongly agree), adapted from previously published papers. ACQUI was measured using eight items from Gold *et al.* (2001). STORE was measured using eight items from Donate and Guadamillas (2010). SHARE was measured using eight items from Hooff and Hendrix (2004). APPLY was measured using seven items adapted from Gold *et al.* (2001). Innovation was measured using seven items from Chen and Huang (2009). The adaptations follow four criteria: first, a translate-back process was applied; second, a preliminary assessment was conducted by the research group; third, the questionnaire was examined by four researchers specialized in KM and Innovation; four, the questionnaire underwent a pilot test using 12 potential respondents.

Data were gathered using an online survey distributed among member of four associations of information and communication technology firms from Brazil and Portugal. The Brazilian Association of Software Companies (ABES), the Portuguese Association for the Promotion and Development of the Information Society (APDSI), the Brazilian Association of Information Technology Companies (ASSESPRO) and the Portuguese Software Association (ASSOFT) made the questionnaire available to their affiliates. After standard procedures for data cleaning, a sample size of 341 observations was attained (223 Brazilian and 118 Portuguese responses). Table I shows the survey data sociodemographic information.

**Table I.**  
Sociodemographic  
information of  
surveyed data

Criterion	Total (%)	Brazil (%)	Portugal (%)
<i>Respondent gender</i>			
Male	292 (86%)	189 (85%)	103 (87%)
Female	49 (14%)	34 (15%)	15 (13%)
<i>Respondent organizational level</i>			
Strategic	221 (65%)	164 (73%)	57 (48%)
Tactical	82 (24%)	44 (20%)	38 (32%)
Operational	38 (11%)	15 (7%)	23 (19%)
<i>Firm age (in years)</i>			
00-09	116 (34%)	75 (34%)	41 (35%)
10-20	119 (35%)	90 (40%)	29 (25%)
21+	106 (31%)	58 (26%)	48 (41%)
<i>Firm size (in number of employees)</i>			
00-10	135 (40%)	94 (42%)	41 (35%)
11-50	105 (30%)	79 (35%)	26 (22%)
51+	101 (30%)	50 (22%)	51 (43%)
<i>Firm has formal KM processes</i>			
Yes	139 (41%)	88 (39%)	51 (43%)
No	202 (59%)	135 (60%)	67 (57%)

*Qualitative procedures, instrument and data*

The qualitative steps followed the procedures suggested by Miles *et al.* (2014), and Yin (2014). The data were codified by applying cycles of coding and sub-coding, using MAXQDA® software for operational support. The interview script was derived from the quantitative tests results, according to the following logic:

- If the hypothesis is supported and there is no difference between groups, the result can be explained following the extant literature;
- If the hypothesis is supported and there is a difference between groups, the difference was investigated using the qualitative approach;
- If the hypothesis is not supported and there is no statistical difference between groups, the hypothesis was investigated using the qualitative approach; and
- If the hypothesis failed to receive statistical support and there is a difference between groups, the result was investigated using the qualitative approach.

The qualitative data were collected during interviews with managers from those organizations that had completed the survey. Following saturation criteria, ten interviews were conducted (6 with Brazilian and 4 with Portuguese managers). Interviews were recorded (average time duration was 67 min, ranging from 33 to 90 min) and transcribed.

**Results***Quantitative data analysis*

Partial least squares (PLS) path-modelling procedures were applied to test the general model and compare Brazilian and Portuguese data sets. The standard recommendations for evaluating PLS models by convergent and discriminant validities, internal consistency, collinearity and model coefficients were followed (Hair *et al.*, 2014; Sanchez, 2013). The results for item loadings and average variance extracted (convergent validity), cross-loadings and

Heterotrait-Monotrait (HTMT) ratio of correlations (discriminant validity), Cronbach's alpha and composite reliability (internal consistency) and variance inflate factors (collinearity issues) were all satisfactory. Appendix A shows all the assessments. Although the item loadings of three variables (acq\_2, acq\_8 and sto\_8) showed measures below the recommended 0.7, those variables were maintained so that scales used would be comparable to the original ones. The rest of the variables reached values over the threshold. The AVE values were well above the minimum level of 0.5. An indicator's loadings on its own construct are in all cases higher than all its cross loadings with other constructs. The HTMT ratio of correlation shows that all values are below the threshold of 0.9. The Cronbach's alpha and CR values ranged from 0.8640 to 0.938 and 0.894 to 0.949, respectively. The Maximum VIF value was 2.876, which is below the suggested threshold (5). Furthermore, the results attest adequate convergent and discriminant validities, internal consistency and collinearity levels. The categorical moderation effect (Hair *et al.*, 2014) of the country variable was assessed using the Bootstrap *t*-test approach (Sanchez, 2013) with 5000 repetitions. Table II demonstrates results for the global structural model, which support *H1*, *H2* and *H4*, and results for country comparison model, which demonstrate there is no difference in any of the KM processes and innovation comparing Brazil and Portugal except for the relationship between knowledge sharing and innovation.

Despite the different path values, they are statistically equal, only *H3* was statistically not supported, indicating the existence of difference in the relationship between knowledge sharing processes and innovation according to country. Given this, the theoretical arguments provided in previous papers can be repeated to explain why knowledge management processes (acquisition, storage and application) have a positive relationship with innovation (*H1*, *H2* and *H4*). *H3* (knowledge sharing is related positively to innovation) was not supported and showed difference between the two countries. Structural model and country comparison results (Table II) suggests knowledge sharing processes have a positive effect on innovation within Portuguese enterprises, while the same does not occur within Brazilian enterprises.

According to theory, sharing affects synergies between agents and their knowledge (Argote and Ingram, 2000; Donate and Guadamillas, 2010). Those synergies foster perceptions, consolidation and the availability of knowledge within enterprises (Chen and Huang, 2009), which has an important role in innovation (Andreeva and Kianto, 2011; Darroch, 2005; Nonaka, 1991). Those claims are sustained regarding Portuguese enterprises, but not regarding Brazilian enterprises. The lack of statistical support for *H3* (Global and Brazilian paths) and the difference between Brazilian and Portuguese results led to the adoption of the qualitative approach.

*Qualitative data analysis*

Sharing is a process that is supposed to highlight individual expertise within companies and promote teaching and learning synergies among company members. Sharing has a positive

Hypothesis (Path)	Global structural model results		Country comparison model results		
	Global path (sd)	<i>p</i> -value	Br path	Pt path	<i>p</i> -value
<i>H1</i> (ACQUI – INNOVATION)	0.138 (0.063)	0.029**	0.100	0.221	0.171
<i>H2</i> (STORE – INNOVATION)	0.156 (0.053)	0.004*	0.170	0.153	0.451
<i>H3</i> (SHARE – INNOVATION)	0.084 (0.053)	0.114	0.017	0.195	0.049**
<i>H4</i> (APPLY – INNOVATION)	0.450 (0.068)	0.000**	0.496	0.360	0.158

**Notes:** OBS: sd = standard deviation; Br = Brazil; Pt = Portugal; \* = supported ( $\alpha = 5\%$ ); \*\* = supported ( $\alpha = 1\%$ )

**Table II.**  
Global structural  
model and country  
comparison model  
results



effect on innovation because it contributes towards individual experience exposure, connection, selection, consolidation within enterprises.

The lack of statistical support may be explained by compensation effects: when a goal is not reached, the firm stimulates alternatives to fill the gap to achieve expected results. Portuguese enterprises may compensate for having a more introspective culture and geographically scattered operations by more making use of knowledge sharing processes. Respondents understand that interpersonal skills are a significant part of the Brazilian cultural trait, which is associated with the idea that is not necessary to create or adopt knowledge sharing processes. Portuguese culture is less open than the Brazilian, which explains the more widespread adoption and usage of knowledge sharing processes.

Interpersonal relationships are more easily built within Brazilian culture compared with Portuguese culture. Within Brazilian cultural standards, firms had less need to implement sharing processes and compensate for individual constraints to efficient knowledge sharing. The relationship between sharing and innovation is perceived within Portuguese enterprises because of the need to compensate gaps in interpersonal and communication skills.

Sharing was also identified as a tool to compensate the communication constraints that may occur when firms develop scattered operations. As European markets are more open and economically integrated, developing synergistic organizational activities simultaneously in many places is more common among Portuguese than Brazilian enterprises.

None of the Brazilian interviewees mentioned anything regarding using knowledge sharing processes to compensate for having geographically scattered activities. It cannot be claimed that the Brazilian context is similar to that experienced by European countries engaged in the process of economic integration. The adoption of knowledge sharing processes to foster innovation and overcome the drawbacks of having geographically scattered operations was a behaviour identified within the Portuguese organizations. By contrast, no such policy was identified with the Brazilian corporative context. [Table III](#) shows excerpts from interviews.

## Summary and conclusions

### *Discussion of the results*

This paper has examined the relationship between KM processes and innovation by comparing two countries. Four hypotheses were tested, as also the country-level effect (categorical mediator variable). Statistical analysis has given support to *H1*, *H2* and *H4*. Accordingly, by using ACQUI, enterprises keep themselves up-to-date with innovations within markets ([Martinez-Canas et al., 2012](#)). Better STORE were related to better knowledge repositories, which facilitates the development of new combinations of existing knowledge ([Andreeva and Kianto, 2011](#); [Gold et al., 2001](#)). APPLY enhance the understanding and mastery of knowledge, fostering new usages of acquired knowledge ([Chen and Huang, 2009](#); [Gold et al., 2001](#)). The statistical tests used here support the existence of similarities between Brazilian and Portuguese enterprises with respect to the relationship between KM processes (acquisition, storage and application) and innovation.

*H3* was not supported by the statistical tests. Group comparison through bootstrap *t*-test showed that Brazilian and Portuguese enterprises behave differently with respect to the relationship between SHARE and innovation. While testing supported (*H3*) in relation to the Portuguese data, the same test failed to support the hypothesis using Brazilian data.

The absence of a relationship may have two explanations: the first possibility is that both elements are present, but they are not related to each other; the second possibility is that at least one of the elements is not present, which made it impossible perceive the relationship, even though the relationship exists. Considering previous investigations which identify an

**Table III.**  
Excerpts from  
interviews

Mechanisms	Excerpt
Compensation for lack of interpersonal skill	I think Brazilians interact more, that's a factor that favors a fraternal and familiar environment . . . even though I don't have board of directors that says what each person is expert about here, I already know what each one knows here inside, to whom I can turn in a certain situation. So, this informal knowledge-sharing environment manages to be sustainable within the enterprise." (Brazilian interviewee_01)
Compensation for lack of interpersonal skill	Yes, but the point is; come on, in Brazil it may be easier, because people are more uninhibited. But therefore, as we know the Portuguese culture, and now I have already perceived the issue, we have tools to overcome this inhibition: the brainstorming. Brainstorming itself, the way it is done, is intended to overcome all these barriers. One of the rules of the brainstorming we do is that there is no kind of criticism, and people can talk at will." (Portuguese interviewee_03)
Compensation for lack of interpersonal skill	The development people are there in a room, they work together, and they know who to ask. So, we avoid it [formal knowledge sharing processes]. It's very cool to have all the processes well defined, but there are some things that only generate weight to small company. Informality still resolves." (Brazilian interviewee_04)
Compensation for scattered organizational activities	"We have people in Madrid, Lisbon and France. . . . Yes, it's becoming much more common. In the United States it's even more common for people to work from home, and more normal to have offices on both coasts. Here, I think, 20 years ago it was very local, but it's more and more common to see companies working in a distributed way on a day by day basis." (Portuguese interviewee_02)
Compensation for scattered organizational activities	". . . the geographical issues are least important depending on the [knowledge sharing] tools that are available". (Brazilian interviewee_06)

association between sharing and innovation (Dahiyat, 2015), the results found in the present study were treated according the second line of thought.

According to the interviewees, the absence of the relationship between SHARE and innovation can be explained by the absence of SHARE. Knowledge may be shared within Brazilian enterprises, but that does not occur through processes, but rather by serendipitous means, due to frequent and informal contact. Interviewees reported that within Brazilian enterprises, SHARE is expected to occur based on individuals who have interpersonal and social skills. Individual solve their sharing issues by their own means, which means it is difficult for organizations to establish norms and processes to guide and foster SHARE.

However, Portuguese enterprise faced two contextual elements which suggest the need to institute SHARE: an introspective culture and the fact their activities are scattered across Europe. The need to provide a collaborative environment leads members of Portuguese organizations to adopt and nurture processes that leverage SHARE. Portuguese organizations need to maintain remote communication that facilitates the quality of communication that occurs at the personnel level.

Other cultural values may also influence the members of Brazilian enterprises, hampering the implementation or development of sharing. The act of sharing knowledge is dependent on the intentions and actions of individuals, who need to actively donate or collect knowledge. It may be that certain perspectives with respect to the value of knowledge may constrain or depress an individual's willingness to sharing knowledge (Kamasak and Bulutlar, 2010).

Dahiyat (2015) identified a positive relationship between knowledge integration (a concept that encompass sharing) and innovation within knowledge intensive businesses in Jordan.

Comparing national cultures (Hofstede *et al.*, 2010; The Hofstede Centre, 2015), Jordanian culture differs from that of Brazil and is closer to Portuguese culture regarding the long/short-term orientation. Considering that a long-term orientation is characterized for valuing perseverance and stability, innovation might be more prone to occur among agents within a short-term orientation culture (Klonoski, 2012), as in the case of Jordan and Portugal. Brazilian culture is considered intermediate with regard long/short-term orientation, and the perseverance of values seems to materialize in disinterest in collecting knowledge from others, which would explain the failure to identify a positive relationship between SHARE and innovation.

Individualistic societies encourage personal goals, whereas collectivist societies are more connected to group achievements (Singh, 2006). As interpersonal interaction is beneficial to knowledge sharing, it is plausible collectivist cultures being more prone to practice knowledge sharing processes than individualistic cultures. For example, Chinese culture is characterized by a collectivist orientation, so trust among employees plays an important role in leveraging collaborative processes. Trust enables employees to social interaction, thus building connectedness and shared meanings among employees, which facilitates knowledge to flow freely (Zhang *et al.*, 2018). According to results shown, the relationship between knowledge sharing and innovation receive statistical support among Portuguese companies (a more collectivist culture), while the same does not occur among Brazilian companies (a more individualistic culture). Besides, Shujahat *et al.* (2019) had also identified statistical support to the relationship between knowledge sharing and innovation among Pakistani companies (also a collectivist culture), which in turn reinforces the point made.

As dimensions of national culture, masculinity is characterized by aggressive, assertive and competitive behaviours, whereas feminine cultures tend to produce more friendly, flexible and cooperative behaviour (Hofstede *et al.*, 2010). Within competitive societies, the individuals are more prone to develop a perception that possessing knowledge gives an advantage over others, which reduces SHARE (Calza *et al.*, 2011). As Brazilian culture is more masculine than the Portuguese, SHARE can be expected to be less present in Brazilian enterprises than in Portuguese ones.

#### *Summary of results*

KM corresponds to a set of processes that can foster innovation. Although statistical testing supports the hypotheses of a positive relationship between ACQUI, STORE and APPLY (all three KM processes) with innovation, the same tests did not provide statistical support to the relationship between SHARE and innovation. Categorical moderation test and qualitative procedures help to identify explanations for the unsupported hypothesis of a positive relationship between SHARE and innovation.

The findings of the present study suggest there is no positive relationship between the SHARE and innovation in Brazilian enterprises because the enterprises believe the communications skills of their members are sufficient, and thus they have no need to introduce processes that facilitate SHARE. Within Portuguese enterprises, SHARE is adopted to compensate for introspective behaviour and/or the fact their activities are scattered around the European Market. This result is consistent with Tassabehji *et al.* (2019, p. 948), who identified that personal “freedom to be innovative and donate their knowledge when required” can compensate the absence of a formal knowledge management system. According to results shown, Brazilian firms rely on extrovert behaviour and communication skills to compensate for the absence of formal knowledge sharing initiatives.

A second analysis explains the lack of relationship between SHARE and innovation based on the dimensions of national culture. The apparent absence of a relationship between SHARE and innovation within Brazilian companies may be explained by disinterest in

---

collecting knowledge from the other members (behaving according to a long-term orientation, which values stability and resistance to novelty) and attempts to withhold valuable knowledge from colleagues (behaving competitively, as in masculine societies). This result is consistent with [Obeidat et al. \(2016\)](#), who analyzed the impact of KM processes on innovation in Jordanian consulting firms. According to [Obeidat et al. \(2016, p. 1231\)](#):

The main limitation to knowledge sharing can be the fear of losing control, as the consultant's power is his/her knowledge; therefore, sharing this knowledge with others will decrease the level of his/her power, that is why consultants are unwilling to share a huge amount of their knowledge.

This research made two main contributions. First, through the analysis of the moderating effect of the country variable. The country variable is present in several studies that analyze the KM-innovation relationship, but cross-country comparisons are still scarce. Moreover, by comparing a developed and a developing country, the present paper contributes to research on knowledge management not focused on developed countries, a gap highlighted by [Dzenopoljac et al. \(2018\)](#) and [Turulja and Bajgorić \(2018\)](#). Second, through a qualitative analysis, it was possible to identify social and contextual issues that interfere in the relationship between KM processes and innovation. Accordingly, social and contextual factors may hinder both intrafirm (e.g. a multinational expanding its operations) and interfirm (e.g. open innovation processes) adaptations.

#### *Managerial implications*

As highlighted by [Martínez-Costa et al. \(2019, p.9\)](#), “companies that aim to develop common innovation projects are obliged to develop their knowledge management processes internally [. . .] to leverage the ties they establish with other companies”. In this sense, both interfirm and intrafirm changes may demand an in deep examinations of contextual factors which may hinders the adaptability of current knowledge management processes to alien context. According to results shown, even when this adaptation occurs between barely different realities, companies must be cautious with contextual factors which may hide hazards. Specifically, knowledge sharing processes are nurtured in social systems, which can assume different necessities of interaction and trust levels. Considering that knowledge management processes provides “a knowledge-driven culture” ([Hassan and Raziq, 2019, p. 1005](#)), and cultural adaptations could be very challenging processes, the transference of processes, practices and persons from a context to another should be conditioned to a quarantine period, which made possible to evaluate adaptations needed, and so spawns this knowledge-driven culture better.

#### *Limitations and future research directions*

This research presents some limitations that may be the starting points for future research. Interviewees and survey respondents were members of information and communication technology companies. Although this sector has a strong relationship with the KM, it is possible that the results identified for this sector cannot be replicated to other sectors (non-technological, for example). Future research could use data from other economic sectors. The cultural difference between the countries analysed is rather subtle, suggesting that the conclusions should be taken with caution. Future research could replicate the model and strategy using data from countries with more divergent cultures. Despite Hofstede's framework has being been actualized and two more dimensions were been included, interviewees did not express any way of how these dimensions could affect the relationship between KM and innovation. Future research could explore the effects of these dimensions on the relationship between KM and Innovation (e.g. the effect of indulgence versus restraint

dimension on the relationship between KM and Innovation). Finally, the KM model used was simple and did not observe relations between the KM processes. Further developments may add relationships between KM processes in this framework.

## References

- Abro, Q.M., Memon, N.A. and Rashdi, P.I.S. (2009), "Strategic factors for enhancing the innovativeness of the nanotechnology firms", *International Journal of Business Innovation and Research*, Vol. 3 No. 6, pp. 596-609.
- Adler, N.J. and Gundersen, A. (2007), *International Dimensions of Organizational Behavior*, Cengage Learning, Eagan, MN.
- Alavi, M. and Leidner, D.E. (2001), "Review: knowledge management and knowledge management systems: conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 No. 1, pp. 107-136.
- Alegre, J., Sengupta, K. and Lapiedra, R. (2013), "Knowledge management and innovation performance in a high-tech SMEs industry", *International Small Business Journal: Researching Entrepreneurship*, Vol. 31 No. 4, pp. 454-470, available at: <https://doi.org/10.1177/0266242611417472>
- Allameh, S.M., Rezaei, A. and Seyedfazli, H. (2017), "Relationship between knowledge management enablers, organisational learning, and organisational innovation: an empirical investigation", *International Journal of Business Innovation and Research*, Vol. 12 No. 3, pp. 294, available at: <https://doi.org/10.1504/IJBIR.2017.082087>
- Anand, A. and Singh, M. (2011), "Understanding knowledge management", *International Journal of Engineering, Science and Technology*, Vol. 3 No. 2, pp. 926-939.
- Andreeva, T. and Kianto, A. (2011), "Knowledge processes, knowledge-intensity and innovation: a moderated mediation analysis", *Journal of Knowledge Management*, Vol. 15 No. 6, pp. 1016-1034. available at: <https://doi.org/10.1108/13673271111179343>
- Aranda, D.A. and Molina-Fernandez, L.M. (2002), "Determinants of innovation through a knowledge-based theory lens", *Industrial Management & Data Systems*, Vol. 102 No. 5, pp. 289-289.
- Argote, L. and Ingram, P. (2000), "Knowledge transfer: a basis for competitive advantage in firms", *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 150-169.
- Bermejo, P.H., de S., Tonelli, A.O., Galliers, R.D., Oliveira, T. and Zambalde, A.L. (2016), "Conceptualizing organizational innovation: the case of the Brazilian software industry", *Information and Management*, Vol. 53 No. 4, pp. 493-503, available at: <https://doi.org/10.1016/j.im.2015.11.004>
- Bhagat, R.S., Kedia, B.L., Harveston, P.D. and Triandis, H.C. (2002), "Cultural variations in the cross-border transfer of organizational knowledge: an integrative framework", *The Academy of Management Review*, Vol. 27 No. 2, pp. 204-221.
- Cagliano, R., Caniato, F., Golini, R., Longoni, A. and Micelotta, E. (2011), "The impact of country culture on the adoption of new forms of work organization", *International Journal of Operations and Production Management*, Vol. 31 No. 3, pp. 297-323.
- Calza, F., Canestrino, R. and Cannavale, C. (2011), "Why should I share my new ideas? Cultural barriers to innovation spreading", Presented at the 12th European Conference on Knowledge Management, Academic Pub, Germany.
- Chen, C.-J. and Huang, J.-W. (2009), "Strategic human resource practices and innovation performance - the mediating role of knowledge management capacity", *Journal of Business Research*, Vol. 62 No. 1, pp. 104-114, available at: <https://doi.org/10.1016/j.jbusres.2007.11.016>
- Chen, C.-J., Huang, J.-W. and Hsiao, Y.-C. (2010), "Knowledge management and innovativeness: the role of organizational climate and structure", *International Journal of Manpower*, Vol. 31 No. 8, pp. 848-870, available at: <https://doi.org/10.1108/01437721011088548>
- Costa, V. and Monteiro, S. (2016), "Knowledge processes, absorptive capacity and innovation: a mediation analysis", *Knowledge and Process Management*, Vol. 23 No. 3, pp. 207-218.

- Couto, J.P. and Vieira, J.C. (2004), "National culture and research and development activities. Multinatl", *Bus. Rev.*, Vol. 12 No. 1, pp. 19-36, available at: <https://doi.org/10.1108/1525383X200400002>
- Dahiyat, S.E. (2015), "An integrated model of knowledge acquisition and innovation: examining the mediation effects of knowledge integration and knowledge application", *International Journal of Learning and Change*, Vol. 8 No. 2, pp. 101-135.
- Darroch, J. (2005), "Knowledge management, innovation and firm performance", *Journal of Knowledge Management*, Vol. 9 No. 3, available at: <https://doi.org/10.1108/13673270510602809>
- Donate, M.J. and Guadamillas, F. (2010), "The effect of organizational culture on knowledge management practices and innovation", *Knowledge Process Management*, Vol. 17 No. 2.
- Dunphy, S.M. and Herbig, P. (1994), "Comparison of innovative capabilities among the Anglo-American countries: the case for structural influences on innovation", *Management Decision*, Vol. 32 No. 8, pp. 50-56.
- Dzenopoljac, V., Alasadi, R., Zaim, H. and Bontis, N. (2018), "Impact of knowledge management processes on business performance: evidence from Kuwait", *Knowledge and Process Management*, Vol. 25 No. 2, pp. 77-87, doi: [10.1002/kpm.1562](https://doi.org/10.1002/kpm.1562).
- Fidel, P., Cervera, A. and Schlesinger, W. (2016), "Customer's role in knowledge management and in the innovation process: effects on innovation capacity and marketing results", *Knowledge Management Research and Practice*, Vol. 14 No. 2, pp. 195-203.
- Gold, A.H., Malhotra, A. and Segars, A.H. (2001), "Knowledge management: an organizational capabilities perspective", *Journal of Management Information Systems*, Vol. 18 No. 1, pp. 185-214.
- Gurteen, D. (1998), "Knowledge, creativity and innovation", *Journal of Knowledge Management*, Vol. 2 No. 1, pp. 5-13.
- Hair, J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2014), *A Primer on Partial Least Squares Structural Equations Modeling (PLS-SEM)*, SAGE, Los Angeles.
- Hassan, N. and Raziq, A. (2019), "Effects of knowledge management practices on innovation in SMEs", *Management Science Letters*, Vol. 9 No. 7, pp. 997-1008, available at: <https://doi.org/10.5267/j.msl.2019.4.005>
- Heisig, P. (2009), "Harmonisation of knowledge management – comparing 160 KM frameworks around the globe", *Journal of Knowledge Management*, Vol. 13 No. 4, pp. 4-31, available at: <https://doi.org/10.1108/13673270910971798>
- Hofstede, G.H. (1980), *Culture's Consequences: international Differences in Work-Related Values*, Cross Cultural Research and Methodology Series, Sage Publications, Beverly Hills, Calif.
- Hofstede, G., Hofstede, G.J. and Minkov, M. (2010), *Cultures and Organizations: Software of the Mind*, 3rd ed., McGraw-Hill Education, New York.
- Hooff, B. and Hendrix, L. (2004), "Eagerness and willingness to share: the relevance of different attitudes towards knowledge sharing", *5th European Conference on Organizational Knowledge, Learning and Capabilities*.
- House, R.J., Hanges, P.J., Javidan, M., Dorfman, P.W. and Gupta, V. (2004), *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*, Sage publications, Thousand Oaks, Calif.
- Hsu, I.-C. and Sabherwal, R. (2011), "From intellectual Capital to firm performance: the mediating role of knowledge management capabilities", *IEEE Transactions on Engineering Management*, Vol. 58 No. 4.
- Hsu, I.-C. and Sabherwal, R. (2012), "Relationship between intellectual capital and knowledge management: an empirical investigation", *Decision Sciences*, Vol. 43 No. 3, p. 489.
- Javidan, M., Stahl, G.K., Brodbeck, F. and Wilderom, C.P. (2005), "Cross-border transfer of knowledge: cultural lessons from project GLOBE", *Academy of Management Perspectives*, Vol. 19 No. 2, pp. 59-76.

- Kamasak, R. and Bulutlar, F. (2010), "The influence of knowledge sharing on innovation", *European Business Review*, Vol. 22 No. 3, pp. 306-317, available at: <https://doi.org/10.1108/09555341011040994>
- King, W.R. (2008), "Questioning the conventional wisdom: culture-knowledge management relationships", *Journal of Knowledge Management*, Vol. 12 No. 3, pp. 35-47, available at: <https://doi.org/10.1108/13673270810875840>
- Klonoski, R. (2012), "How important is creativity? The impact of age, occupation and cultural background on the assessment of ideas", *Journal of Applied Business Research (JABR)*, Vol. 28 No. 3, pp. 411-426.
- Mageswari, S.U., Sivasubramanian, R.C. and Dath, T.S. (2017), "A comprehensive analysis of knowledge management in Indian manufacturing companies", *Journal of Manufacturing Technology and Management*, Vol. 28 No. 4, pp. 506-530.
- Magnier-Watanabe, R. and Senoo, D. (2010), "Shaping knowledge management: organization and national culture", *Journal of Knowledge Management*, Vol. 14 No. 2, pp. 214-227.
- Martinez-Canas, R., Saez-Martinez, F.J. and Ruiz-Palomino, P. (2012), "Knowledge acquisition's mediation of social capital-firm innovation", *Journal of Knowledge Management*, Vol. 16 No. 1, pp. 61-76. available at: <https://doi.org/10.1108/13673271211198945>
- Martínez-Costa, M., Jiménez-Jiménez, D. and Dine Rabeh, H.A. (2019), "The effect of organisational learning on interorganisational collaborations in innovation: an empirical study in SMEs", *Knowledge Management Research & Practice*, Vol. 17 No. 2, pp. 137-150, doi: [10.1080/14778238.2018.1538601](https://doi.org/10.1080/14778238.2018.1538601).
- Mehrabani, S.E. and Shajari, M. (2012), "Knowledge management and innovation capacity", *Journal of Management Research*, Vol. 4 No. 2, pp. 164-177.
- Migdadi, M.M., Zaid, M.K.A., Yousif, M., Almestarihi, R. and Al-Hyari, K. (2017), "An empirical examination of knowledge management processes and market orientation, innovation capability, and organisational performance: insights from Jordan", *Journal of Information and Knowledge Management*, Vol. 16 No. 01, p. 1750002.
- Miles, M.B., Huberman, A.M. and Saldaña, J. (2014), *Qualitative Data Analysis: A Methods Sourcebook*, 3rd ed., SAGE Publications, Thousand Oaks, CA.
- Nonaka, I. (1991), "The knowledge-creating company", *Harvard Business Review*, Vol. 69 No. 6, pp. 96-96.
- Obeidat, B.Y., Al-Suradi, M.M., Masa'deh, R. and Tarhini, A. (2016), "The impact of knowledge management on innovation: an empirical study on Jordanian consultancy firms", *Management Research Review*, Vol. 39 No. 10, pp. 1214-1238.
- OECD (2005), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd ed, OECD Publishing, Luxembourg.
- Overall, J. (2015), "A conceptual framework of innovation and performance: the importance of leadership, relationship quality, and knowledge management", *Academy of Entrepreneurship Journal*, Vol. 21 No. 2, pp. 41.
- Pawlowsky, P. and Schmid, S. (2012), "Interrelations between strategic orientation, knowledge management, innovation and performance. Empirical findings from a national survey in Germany", *International Journal of Knowledge Management Studies*, Vol. 5 Nos 1/2, pp. 185-209.
- R Core Team (2016), *R: A Language and Environment for Statistical Computing*, R Foundation for Statistical Computing, Vienna, Austria.
- Reinig, B.A. and Mejias, R.J. (2004), "The effects of national culture and anonymity on flaming and criticalness in GSS-Supported discussions", *Small Group Research*, Vol. 35 No. 6, pp. 698-723, available at: <https://doi.org/10.1177/1046496404266773>
- RStudio Team (2015), *RStudio: Integrated Development Environment for R*, RStudio, Inc., Boston, MA.

- Rusly, F.H., Corner, J.L. and Sun, P. (2012), "Positioning change readiness in knowledge management research", *Journal of Knowledge Management*, Vol. 16 No. 2, pp. 329-355, available at: <https://doi.org/10.1108/13673271211218906>
- Saffu, K. (2003), "The role and impact of culture on South pacific island entrepreneurs", *International Journal of Entrepreneurial Behavior and Research*, Vol. 9 No. 2, pp. 55-73.
- Sanchez, G. (2013), *PLS Path Modeling with R*, Berkeley Trowchez Ed.
- Shahraki, M. and Keshtegar, A. (2016), "The relationship between knowledge management with creativity and innovation", *The Social Sciences*, Vol. 11 No. 6, pp. 922-927, available at: <https://doi.org/10.3923/sscience.2016.922.927>
- Shane, S. (1993), "Cultural influences on national rates of innovation", *Journal of Business Venturing*, Vol. 8 No. 1, pp. 59-73.
- Shore, B. and Cross, B.J. (2005), "Exploring the role of national culture in the management of large-scale international science projects", *International Journal of Project Management*, Vol. 23 No. 1, pp. 55-64, available at: <https://doi.org/10.1016/j.ijproman.2004.05.009>
- Shujahat, M., Sousa, M.J., Hussain, S., Nawaz, F., Wang, M. and Umer, M. (2019), "Translating the impact of knowledge management processes into knowledge-based innovation: the neglected and mediating role of knowledge-worker productivity", *Journal of Business Research*, Vol. 94, pp. 442-450, available at: <https://doi.org/10.1016/j.jbusres.2017.11.001>
- Simao, L. and Franco, M. (2018), "External knowledge sources as antecedents of organizational innovation in firm workplaces: a knowledge-based perspective", *Journal of Knowledge Management*, Vol. 22 No. 2, pp. 237-256, available at: <https://doi.org/10.1108/JKM-01-2017-0002>
- Singh, P.K. (2018), "Knowledge strategy, sharing behavior and performance: reviewing a knowledge-oriented approach", *Management Research Review*, Vol. 41 No. 3, pp. 395-411, available at: <https://doi.org/10.1108/MRR-01-2017-0001>
- Singh, S. (2006), "Cultural differences in, and influences on, consumers' propensity to adopt innovations", *International Marketing Review*, Vol. 23 No. 2, pp. 173-191.
- Strese, S., Adams, D.R., Flatten, T.C. and Brettel, M. (2016), "Corporate culture and absorptive capacity: the moderating role of national culture dimensions on innovation management", *International Business Review*, Vol. 25 No. 5, pp. 1149-1168, available at: <https://doi.org/10.1016/j.ibusrev.2016.02.002>
- Tassabehji, R., Mishra, J.L. and Dominguez-Péry, C. (2019), "Knowledge sharing for innovation performance improvement in micro/SMEs: an insight from the creative sector", *Production Planning and Control*, Vol. 30 Nos 10/12, pp. 935-950, available at: <https://doi.org/10.1080/09537287.2019.1582101>
- The Hofstede Centre (2015). "Country comparison [WWW document] Hofstede cent", available at: <http://geert-hofstede.com/countries.html> (accessed 12 January 2015).
- Turulja, L. and Bajgorić, N. (2018), "Knowledge acquisition, knowledge application, and innovation towards the ability to adapt to change", *International Journal of Knowledge Management*, Vol. 14 No. 2, pp. 1-15, available at: <https://doi.org/10.4018/IJKM.2018040101>
- Yin, R.K. (2014), *Case Study Research: design and Methods*, 5th ed., SAGE, Los Angeles.
- Yusr, M.M., Yusr, M.M., Mokhtar, S.S.M., Mokhtar, S.S.M., Othman, A.R., Othman, A.R., Sulaiman, Y. and Sulaiman, Y. (2017), "Does interaction between TQM practices and knowledge management processes enhance the innovation performance? ", *International Journal of Quality and Reliability Management*, Vol. 34 No. 7, pp. 955-974.
- Zhang, M., Zhao, X. and Lyles, M. (2018), "Effects of absorptive capacity, trust and information systems on product innovation", *International Journal of Operations and Production Management*, Vol. 38 No. 2, pp. 493-512, available at: <https://doi.org/10.1108/IJOPM-11-2015-0687>



Items	Construct	Loadings	Cross loadings
<i>Knowledge acquisition – Original scale (Gold et al., 2001) (<math>\alpha = 0.864</math>; CR = 0.894; AVE = 0.515; HTMT = 0.509 – 0.802; VIF = 1.481 – 2.325)</i>			
<i>Does your organization . . .</i>			
acq_1	Have formal or informal processes for generating new knowledge from existing knowledge	0.747	0.255 — 0.442
acq_2	Use information from past projects to improve future projects	0.673	0.079 — 0.354
acq_3	Have formal or informal processes for creating knowledge in the organization	0.775	0.158 — 0.415
acq_4	Have formal or informal processes for creating knowledge in conjunction with business partners	0.718	0.253 — 0.383
acq_5	Have formal or informal processes for acquiring knowledge about new products, processes or services in the sector in which it operates	0.799	0.246 — 0.464
acq_6	Have formal or informal processes for acquiring relevant knowledge about its competitors	0.701	0.280 — 0.388
acq_7	Have formal or informal processes for searching for the best practices in the sector that lead to improved performance	0.716	0.163 — 0.409
acq_8	Have teams dedicated to identifying the best practices	0.591	0.141 — 0.318
<i>Knowledge storage process – Original scale (Donate and Guadamillas, 2010) (<math>\alpha = 0.892</math>; CR = 0.915; AVE = 0.568; HTMT = 0.426 – 0.582; VIF = 1.471 – 2.876)</i>			
<i>In your organization . . .</i>			
sto_1	Are the organizational processes documented in forms, procedures, work guidelines, written protocols, manuals etc.	0.736	0.361 — 0.535
sto_2	Are data bases available that enable access to knowledge and previous experience to be used in the future	0.788	0.321 — 0.479
sto_3	Are there directories with telephones or emails that meet the employees' expectations (referencing departments and sections) regarding finding specialist from each area	0.707	0.403 — 0.454
sto_4	Is it possible to access the knowledge repositories, data bases and documents using some type of internal computer network (like internet) that meets expectations	0.782	0.387 — 0.463
sto_5	There are customer databases with updated information about them that meets expectations	0.771	0.405 — 0.551
sto_6	Are the data bases updated to renew the information	0.807	0.404 — 0.546
sto_7	Are there company procedure manuals about problems and methods for solving them that have been successfully applied	0.768	0.411 — 0.490
sto_8	Is it customary to attempt to improve the quality of knowledge	0.660	0.028 — 0.218
<i>Knowledge sharing process – Original scale (Hooff and Hendrix, 2004) (<math>\alpha = 0.938</math>; CR = 0.949; AVE = 0.700; HTMT = 0.426 – 0.584; VIF = 1.563 – 2.783)</i>			
<i>In your organization . . .</i>			
shr_1	When individuals learn something, do they inform other members of the organization?	0.873	0.363 — 0.467
shr_2	Do individuals share the knowledge with other members of the organization?	0.885	0.373 — 0.534
shr_3	Do individuals think the other members of the organization know what they are doing?	0.859	0.378 — 0.487

**Table AI.**  
Statistical results

(continued)

Items	Construct	Loadings	Cross loadings
shr_4	Are individuals in the habit of talking about their activities with other members of the organization?	0.885	0.435 — 0.571
shr_5	When individuals need some specific information, do they ask other members of the organization about the subject?	0.815	0.387 — 0.516
shr_6	Do individuals like to be informed about what other members of the organization know?	0.788	0.338 — 0.428
shr_7	Do individuals ask other members of the organization about their skills when they need something?	0.798	0.422 — 0.492
shr_8	When a member of the company is good at something, do other members of the organization ask that person to teach them what they know?	0.780	0.343 — 0.469
<i>Knowledge application process – Original scale (Gold et al., 2001) (<math>\alpha = 0.930</math>; CR = 0.943; AVE = 0.705; HTMT = 0.582 — 0.802; VIF = 1.402 — 1.760)</i>			
<i>Does your organization . . .</i>			
app_1	Have formal or informal processes for applying the knowledge acquired from errors	0.738	0.124 — 0.295
app_2	Have formal or informal processes for using knowledge to solve new problems	0.814	0.157 — 0.348
app_3	Manage to identify knowledge suitable for the solution of problems and challenges	0.849	0.230 — 0.397
app_4	Use knowledge to improve its performance	0.866	0.252 — 0.405
app_5	Have the skills to apply knowledge capable of producing competitive advantage over the competitors	0.863	0.283 — 0.442
app_6	Manage to apply knowledge to meet critical needs to become more competitive	0.877	0.262 — 0.447
app_7	Manage to combine different knowledge to solve problems	0.861	0.257 — 0.447
<i>Innovation – Original scale (Chen and Huang, 2009) (<math>\alpha = 0.832</math>; CR = 0.945; AVE = 0.711; HTMT = 0.485 — 0.730; VIF = 1.475 — 2.548)</i>			
<i>Does your organization . . .</i>			
inn_1	Have the flexibility to respond to changes in the market?	0.778	0.251 — 0.445
inn_2	Innovate in its planning procedures	0.852	0.328 — 0.493
inn_3	Innovate in its process control systems	0.852	0.312 — 0.470
inn_4	Innovate through resource integration?	0.846	0.286 — 0.440
inn_5	Encourage innovations that provide benefits for its products, services or productive processes	0.889	0.239 — 0.469
inn_6	Incorporate innovations in its products, services or productive processes that produce benefits	0.846	0.215 — 0.438
inn_7	Facilitate the creation of new processes that improve quality and reduce costs	0.833	0.256 — 0.470

Table AI.

**Corresponding author**

Eduardo Kunzel Teixeira can be contacted at: [eduardo.kunzel@hotmail.com](mailto:eduardo.kunzel@hotmail.com)

For instructions on how to order reprints of this article, please visit our website:

[www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)

Or contact us for further details: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)