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The influence of environmental factors on knowledge management and innovation capacity

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Abstract

This study aimed to analyze the relationship between environmental factors, Knowledge Management (KM), absorptive capacity, KM maturity level, and innovation capacity. This research used a descriptive survey of the field and was carried out from a quantitative perspective through an online questionnaire. Then, a multivariate exploratory factorial analysis was carried out, which was followed by Structural Equation Modeling (SEM) to identify and verify significant relationships, both analyses were done using Partial Least Squares (PLS). The PLS-SEM results indicated a high level of significance in the relationship between the organizational environment and KM and innovation capacity respectively. Regarding the hypotheses posed by the research model, positive influences were found in the relationships between environmental factors and knowledge transfer, knowledge transfer and maturity level, as well as maturing level and innovation capacity. Hypotheses involving absorptive capacity were also confirmed. The research framework highlights factors that impact KM and assist in their practical application to reach a high level of knowledge maturity, thus conferring a constant strategic advantage in terms of innovation capacity. A model including organizational environment, knowledge transfer, absorptive capacity, knowledge maturity, and innovation capacity has never before been tested to the best of our knowledge. As for implications for the private sector, this study illuminates how these factors are related, influence each other, and contribute to increasing KM maturity and innovation capacity within a company.

Keywords: Environment factors, knowledge transfer, absorptive capacity, knowledge management maturity level, innovation capacity.

Introduction

Nowadays, diverse values and concepts have become a treasure trove for organizations, with nothing standing out as much as knowledge, a powerful ally that can greatly increase an organization's chances of success (Baldé et al., 2018). In the context of Knowledge Management, (KM) organizations, well aware of the significant effects a good organizational environment can have on their performance, seek to make the most of this in the formulation and evaluation of their strategies (Carayannis, 1999; Theeke, 2016). These organizations also harness Human Resources (HR) policies in pursuit of building better connections with their employees, strengthening relationships and further embedding their personnel into the organizational environment (Rocha & Ceretta, 2013). Because of this, knowledge sharing has become a principal focus of KM (Bock

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et al., 2005; Riege, 2005; Sedighi et al., 2016; Titi Amayah, 2013; Wang & Noe, 2010; Wang et al., 2023). Although several studies have increased awareness of the individual and environmental factors that influence knowledge sharing, this understanding has been limited to its direct, independent effects (Pee & Min, 2017), leading to the need for research that contextualizes, integrates, and studies less direct but still vital effects of these factors as they interact with other elements of the organizational environment.

In general, organizations excel at creating and transferring knowledge, encouraging their employees to communicate and share experiences with each other (Krogh et al., 2006). However, barriers to the knowledge transfer process arise (Sun & Scott, 2005), a phenomenon known as knowledge adherence, in which only a portion of the elements involved in the knowledge transfer process easily absorb knowledge, preferring to retain old techniques and skills rather than adopting new ones. Likewise, collaborators cannot simply cooperate with each other; rather, they should be effectively engaged in sharing, transferring, and absorbing knowledge (Frank et al., 2014). Knowledge adherence interferes with the transfer process, a fact that has given rise to many reasons justified in the literature to mitigate this occurrence (Elwyn et al., 2007; Jensen & Szulanski, 2004; Srikanth & Puranam, 2011). In their work, Huan et al. (2017) evaluate the transfer and absorption of knowledge in the context of organizations as basic structural pillars. Indarti (2010) focuses on absorptive capacity as an important element in knowledge transfer, analyzing the influence of knowledge adherence in the process. Chichkanov (2020) examined the relationship between the knowledge exchanged during client interactions and innovation in Knowledge-Intensive Business Service (KIBS) enterprises. This research adapted the concept of absorptive capacity, i.e., the ability of the firm to successfully deal with external knowledge, to the case of client knowledge being absorbed through the support of information and communication technologies, exploring whether three main dimensions (acquisition, assimilation, and application of client knowledge) are significant enablers of KIBS innovation propensity.

Another point to consider concerns the great efforts being made to leverage knowledge in organizations, making them more innovative and competitive (Scuotto et al., 2017). In this way, competitive advantage, a critical success factor fostered by innovation (Almatrooshi et al., 2016), has become a direct consequence of knowledge sharing among employees in the context of KM (Andreeva et al., 2017; Byukusenge et al., 2016; Collins & Kehoe, 2017; Figueiredo et al., 2016; Liu & Li, 2017; Standing et al., 2016), and this relationship should likewise be explored further, according to the aforementioned literature. Khraishi et al. (2023) stated that, despite the increased attention within supply chain literature on KM processes as important variables for firms to generate performance benefits, little is known about how these variables could impact offshoring innovation relationships held by Small- and Medium-sized Enterprises (SMEs). They investigated the interplay between the internal knowledge creation capability, absorptive capacity, and formal knowledge routines for attaining offshoring innovation benefits for SMEs. Their findings suggested that to succeed in gaining knowledge and subsequent performance benefits from innovation, it is essential for SMEs to create and retain knowledge internally. In addition, they suggested future research that could also look at the underlying linkages between other KM processes to assess their complementary roles in leading to innovation.

Research that focused on innovation development as a result of KM has highlighted some important processes such as knowledge sharing and knowledge storage (Costa & Monteiro, 2016;

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Du Plessis, 2007; Sahibzada et al., 2020). Likewise, it has been argued that a combination of connections between these processes along with various organizational environmental elements plays a key role in generating innovation in numerous contexts (Costa & Monteiro, 2016; Pérez-Salazar et al. 2019; Song et al. 2021). These studies underline the significance of comprehending linkages between the various KM processes, organizational variables, and contextual considerations to generate performance outcomes.

Innovation requires the individuals involved to be willing to share (Chin et al., 2018; Kogut & Zander, 1992), and the exchange of knowledge leads to the creation of new knowledge and innovation (Taylor & Greve, 2006; Tolstoy, 2009). Additionally, under uncertain market conditions, knowledge and innovation management are essential for innovation and achieving competitive advantage in emerging markets (Ciello et al., 2019). However, after inventories were conducted in 2023 using various scholarly databases (Direct, Emerald, Sage, Scielo, Science, Spell, and Wiley) and the simultaneous keywords 'environmental factors,' 'knowledge transfer,' 'absorptive capacity,' 'KM maturity and innovation capacity,' no records including these three expressions were found. As such, considering the models proposed by Pee and Min (2017) regarding the organizational environment, by Huan et al. (2017) related to the transfer, absorption, and adherence of knowledge, by Batista (2016) regarding the maturity of KM, and by Mom et al. (2015) related to innovation, this article presents the following research question: What is the impact of the relationship between the environment, transfer, and absorptive capacity on the maturity of KM and innovation capacity in a company?

Thus, the present study aims to analyze the influence of the organizational environment on the KM and innovation capacity constructs, addressing the relationships between environmental factors, transfer, absorptive capacity, and the maturity of KM, and presenting, in sequence, the evolution, models, and relationships between them. This research is justified, from an academic point of view, because it analyzes the relationship between these constructs – something that has not yet been addressed in academic research, according to the inventories conducted in scholarly databases, as mentioned above - and, from a pragmatic point of view, due to the possibility of supporting organizational best practices, adding value related to the maturity of KM and innovation capacity. In a recent study, Goswami & Agrawal (2023) analyzed the influence of leadership, an aspect of the organizational environment, on knowledge creation and knowledge sharing to explore a possible link between them, recommending further research that includes other antecedents and processes related to KM. This is an example of a study that has examined one factor, whereas the present study treats the elements of the organizational environment as a set. Organizations seek to prioritize, create and transfer knowledge as their basic and structural pillars (Huan et al., 2017), focusing on this knowledge as an essential factor for change in their organizational environment (Song et al., 2018) that is, a way to remain healthy, valuable, innovative and active in the market. According to Huan et al. (2017) and Song et al. (2018), the circulation of knowledge in companies allows them to stay embedded in the market, in addition to fostering innovation.

In this paper, the company Energisa (2013) was chosen as the subject of this case study due to the restructuring it underwent, with several areas of knowledge having been centralized under the organization's Shared Services Center. In this context knowledge was analyzed in conjunction with environmental factors evaluated for its degree of maturity and correlation to innovation capacity.

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Literature review

Knowledge Management

Starting from the nineties, scholars have investigated the concepts of creative industry and knowledge-based economy, emphasizing the role of knowledge as a primary resource of the modern economy and creative industry as the result of individual inspirations, abilities and talents, able to create wealth and employment through the generation and exploitation of intellectual skills and craftsmanship abilities. In this regard, the creative industry has acquired a relevant role in countries such as the UK, Italy, and France (Latilla et al., 2018). An organization owning and managing effectively its knowledge, recognizing it as a critical resource to be transferred among employees and to the new generation, can build a solid and recognizable corporate and brand identity, leveraging on a unique heritage made of quality and creativity, to the point that knowledge can be considered itself as a real financial resource (Davenport and Prusak, 2000). Knowledge has become the most important and strategic factor in development, such that organizations have started to focus on its production, acquisition, transfer, absorption, and application (Spender, 1996). KM has become a critical function that helps to sustain, develop, and improve the innovation capacity of companies, a driving force for the economy (Darroch, 2005; Tangaraja et al., 2015). Because of this, organizations have begun to consider the creation and transfer of knowledge as a fundamental and structural linchpin (Huan et al., 2017) that also happens to be closely linked to the organizational environment (Song et al., 2018). KM practices are also widely used to support actions related to strategic foresight, which have been imperative for companies dealing with various innovation issues with technology, research and development (Adegbile et al., 2017).

The complexity of innovation has been increased by growth in the amount of knowledge available to organizations. Innovation is extremely dependent on the availability of knowledge and therefore, the complexity created by the explosion of richness and reach of knowledge has to be recognized and managed to ensure successful innovation (Du Plessis, 2007). KM has become a cornerstone in emerging business strategies. Post-industrial organizations are knowledge based, and their success and survival depends on creativity, innovation, discovery and inventiveness. An effective reaction to these demands leads not only to changes in individuals and their behaviour but also to innovative changes in organizations to ensure their existence (Read, 1996).

Knowledge Transfer

According to Schwartz (2006), knowledge transfer is defined as the exchange of knowledge between different individuals and/or teams, organizational units, or organizations, sometimes through focused exchange. Knowledge transfer does not necessarily have a specific priority objective. Another definition, also given by Schwartz (2006), focuses on the exchange of knowledge between two individuals: one who communicates the knowledge, and the other who assimilates it. In this version of knowledge transfer, human capital and human interaction are emphasized. However, Schwartz (2006)'s perspective, the effective transfer of knowledge is never carried out since it exists within a context, and each receiver interprets it through his own lens. In the knowledge-based economy, knowledge sharing is increasingly viewed as critical to organizational effectiveness (Quigley *et al.*, 2007). It is argued that knowledge sharing among

employees significantly impacts the performance of both public and private sector organizations (Silvi and Cuganesan, 2006). As a result, knowledge sharing has gained importance in organizations seeking to gain a competitive edge (Felin & Hesterly, 2007).

According to Takeuchi and Nonaka (2008), during the socialization process individuals accumulate and share tacit knowledge, with knowledge transfer taking place through its absorption by actors. Tacit knowledge is converted to explicit knowledge via the externalization process, which lets it be communicated to other actors and forms the basis of new knowledge. That is, organization members accumulate and share tacit knowledge through practical awareness such as concepts, images, and written documents. Organizations can manage knowledge resources more effectively only if employees are willing to share their knowledge with colleagues. To facilitate knowledge sharing among employees and organizations, it is essential to understand the factors influencing employees' willingness to share knowledge. Accordingly, there is a significant amount of research on environmental factors that may influence knowledge sharing in organizations (Amayah, 2013). Several models presenting factors that affect knowledge sharing have been tested in a variety of organizational settings. Some of the variables investigated were analyzed at the individual level, while others examined variables at the team or community level. For instance, Kim and Lee (2006) examined the impact of environmental factors composed by organizational structure, organizational culture, and information technology on employee knowledge sharing capabilities. In research carried out by Huan et al. (2017), knowledge transfer was observed through the analysis of insights that considered the people engaged in this transfer. Their proposal consisted in the presentation of an empirical model of the factors that influence the maturation of knowledge. In this way, knowledge transfer was evaluated from two different perspectives, namely: as a possible influencer of the maturity of organizational KM, and as influenced by the organizational environment.

Absorptive Capacity

A lot of organizations confront strong difficulties in benefiting from external knowledge flows, even in industries with easy-to-access sources of information (Cassiman & Veugelers, 2006; Escribano et al., 2009). To outweigh such deficiencies, enterprises need to develop their absorptive capacity, that is the "ability to recognize the value of new information, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990, p. 128). The concept of absorptive capacity (ACAP) is a prominent topic of scientific inquiry (e.g., Camison & Fores, 2010; Jansen et al., 2005; Zahra & George, 2002) which is gradually gaining recognition as a key driver of a firm's competitive advantage (Lichtenthaler, 2009). In addition, research on absorptive capacity outcomes still lacks integrative examinations of innovation as well as financial measures of performance, while extant work falls short in exploring the interrelationships between them (Lane et al., 2006). Most studies consider innovation as the only outcome of ACAP, a fact that "stands in marked contrast to Cohen and Levinthal's (1989) and 1990 texts that discuss the general commercial application of acquired knowledge" (Lane et al., 2006: 858). Lastly, pertinent research primarily utilizes technology-intensive research settings. However, in order to enhance ACAP's validity as a construct, scholars should further test and replicate its basic theoretical assumptions in environments of diverse technological, economic, and cultural conditions (Tsang & Kwan, 1999).

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Actually, absorptive capacity has received a lot of attention in KM studies and has emerged as one of the key constructs in this field (Chaudhary, 2019). A recent literature review by Agostini et al. (2020) showed that absorptive capacity has been frequently mentioned as a keyword in KM literature during each of the three explored periods: 1998–2009, 2010–2014, and 2015–2019, and is fundamental for contemporary organizations (Zahra & George, 2002). The relevance of this construct is reflected by the importance of knowledge, in terms of its innovation activities. Zahra and George (2002) defined absorptive capacity as a set of routines and processes through which organizations acquire, assimilate, transform, and explore knowledge. From this perspective, innovation can be considered one of the elements that results from absorptive capacity (Lane et al., 2002). The transfer or absorption of knowledge, in this case, refers to the combination of existing knowledge with newly acquired knowledge, or the interpretation of existing knowledge from a new perspective (Appleyard, 1996; Grant, 1996; March 1991).

Indarti (2010), in her research, analyzes the effect of knowledge adherence, as well as the influence of organizational interaction, on an organization's absorptive capacity. Along the same lines, Szulanski (2003) evaluates knowledge adherence as one of the factors that can negatively interfere in knowledge absorption. He describes knowledge adherence as an inherent difficulty in the process of knowledge transfer and replacement. In their work, Huan et al. (2017) proposed an empirical model, examining factors that influence knowledge adherence and absorption. They classified these factors into two categories: the attributes of the nature of knowledge, and the individual differences of people engaged in its transfer. In the present research, part of this model was used, taking advantage of issues related to knowledge absorption and considering the organizational environment studied through dimensions such as time, frequency and planning for the sharing of knowledge.

Maturity of Knowledge Management

If knowledge or intangible assets are the roots of organizations, then KM is about nurturing or strengthening those roots. KM is defined as 'any process of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organizations' (Scarborough et al. 1999). Developing a KM strategy therefore enables an organization to unlock and leverage the different types of knowledge, to identify competencies required to become a forward thinking and learning organization with the ability to put sustainability principles into practice. There is a need for the development of appropriate measures reflecting sustainability objectives and to assess their knowledge implications for continuous improvement. Maturity models in KM are referred to as growth stage models, theories or concepts, analysis lenses whose objective is to evaluate and analyze the evolution of an entity, a concept, or an object over time from an initial state to the highest level of maturity (Hsieh et al. 2009). This refers to the state of perfection, wholeness, and readiness, that develops from the initial embryonic stage to the most advanced one. Such models are used with the aim of overcoming the static nature of assessments as they formally capture the maturation process, assessing the extent to which KM is explicitly defined, administrated, and controlled (Chen & Fong, 2012).

In relation to KM, the use of maturity models is important for several reasons. Serenko et al. (2014) believe that these models describe an evolution of organizational initiatives. Kraemer et al. (2017) consider them a tool capable of enabling and implementing KM initiatives in a systematic and

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structured way that allows for the continuous improvement of organizational processes. One of the academic models used to assess the level of maturity in KM was proposed by Batista (2016), the Instrument for the Assessment of Knowledge Management in Public Administration (IAGCAP). This model has been adapted for this research in order to assess the level of maturity of a private company. According to IAGCAP, the organizational maturity level can be identified, distinguishing strengths and opportunities for improvement in the institutionalization of KM and determining whether the organization has the necessary elements to implement KM, achieving and maintaining the desired results. This model was part of the questionnaire given to employees with regard to the KM maturity construct, having addressed and focused only on the following four dimensions of the six extant: Technology, Knowledge Processes, Learning and Innovation, and KM Results.

Innovative Capacity

Innovation is crucial to the success and survival of companies (Auernhammer & Leslie, 2001). It is a challenge for the company to be innovative and creative to bring to the market stream new, improved, added value products and services that enable the business to achieve higher margins, and thus profits, to reinvest in the business. The concept of innovation has recently emerged in the academic and policy debate as a meta-concept to denote the real and potential capabilities of a system to convert knowledge into innovation that is able to drive long-term economic growth and wealth creation (Freeman, 1995; Furman et al., 2002; Lundvall & Johnson, 1994; Nelson, 1993). It is the process of introducing new ideas to the firm which results in increased firm performance through the implementation of ideas for restructuring or saving of costs, improved communication, new technology for production processes, new organizational structures, and new personnel plans or programs (Robbins, 1996). The ability to innovate is recognized as one of the main aspects that leads to competitive advantage among organizations. Hamel (2000) argues that innovation, considered a key factor in organizational competitiveness, is the most important component in an organization's strategy and characterizes it as a multidimensional phenomenon that implies a novelty or significant improvement. It occurs in different modalities, some of which are determined by the existence of resources or a series of external sources of knowledge (Cassiman & Veugelers, 2006; Love et al., 2014). The complexity of innovation has been increased by growth in the amount of knowledge available to organizations. Innovation is extremely dependent on the availability of knowledge and therefore, the complexity created by the explosion of richness and reach of knowledge has to be recognized and managed to ensure successful innovation (Du Plessis, 2007).

The capacity for innovation, according to Del Giudice and Della Peruta (2016), basically consists of a business process that recombines existing knowledge, including both tacit and explicit, in a differentiated format, aiming at the creation of new products and services. Currently, innovation is no longer restricted to new products or processes (Barrett et al., 2015; Zhao et al., 2023), but rather includes new forms, such as marketing methods that involve significant changes in product or packaging design, price promotions, new products and organizational practices in businesses, external relations, and workplaces (OECD, 2005). In their study, Jyoti et al. (2011) investigated the impact of KM on the innovative capacity of an organization. An extensive review of the literature has been done to frame the dimensions of KM and innovative capacity. The results revealed a significant relationship between KM and innovation. Further, knowledge approach,

knowledge protection, and knowledge utilization processes of KM affect technical as well as non-technical innovation. Given the extreme importance of the aforementioned construct, as can be widely seen in the academic literature, in the present study, innovation capacity was evaluated as possibly having been influenced by the maturity of KM, as a result of organizational factors in the company studied.

Environmental Factors

Environmental factors generally include aspects that are not directly related to short-term activities in an organization but generally influence long-term decisions and changes (Wheelen & Hunger, 1995). There is some segmentation related to environmental factors, the most commonly observed among which refer to the legal/political, economic, sociocultural, and technological spheres (Fifield & Gilligan, 1995). In addition to these, the organizational context, individual and cultural team characteristics, and motivational elements also contribute to environmental factors. These were addressed in the work of Wang and Noe (2010) through the framework developed that focuses on their influence on knowledge sharing. In turn, Chen et al. (2014) investigated the mediating role of business process agility and the moderating roles of environmental factors. Their analyses showed that even though firm-wide IT capability presents the characteristics of rarity, appropriability, non-reproducibility, and non-substitutability, its impact on organizational performance is fully mediated by business process agility. Their results also show that the impact on the environment is multifaceted and nuanced. In particular, environmental hostility weakens the effect of IT capability on business process agility, while environmental complexity strengthens it. In their research, Pee and Min (2017) developed a model explaining how the adequacy or inadequacy of the environment affects knowledge sharing behavior through the influence of affective commitment. The results indicate that the adequacy of the proposed environment regarding collaboration norms, innovation, and variety of knowledge, leads to the development of a stronger affective commitment and more knowledge sharing behavior than when they are absent or surplus. Considering the relevance of these environmental aspects, the present work seeks to analyze the influence of organizational factors on KM and on the capacity for innovation in an organization.

Hypotheses

Environment and Knowledge Transfer

Several studies have been conducted aiming to identify the organizational environment and its various factors as drivers of knowledge sharing behavior (Ipe, 2003; Riege, 2005; Teah et al., 2006; Vincenzo et al., 2015; Wang & Noe, 2010). The more an organization facilitates the transfer of knowledge, the greater the chances of it experiencing positive changes in the performance of employees and in their productivity (Argote et al., 2000). AlShamsi and Ajmal (2018) articulated some aspects inherent to the organizational environment, aiming to identify the critical factors that impact knowledge transfer and their importance in service organizations. In view of this, the following hypothesis was formulated:

H1: The organizational environment influences knowledge transfer.

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Environment and Absorptive Capacity

The organizational environment, with its differing technical, cultural and social experiences, increases the complexity of the learning process (Sahay et al., 2003). Such complexity can be analyzed through two attributes of knowledge: its fragmentation and its absorption—that is, how much and how it can be injected into individuals and organizations (Tiwana, 2003). Thus, the following proposed hypothesis:

H2: The organizational environment influences absorptive capacity.

Knowledge Transfer and Maturity of Knowledge Management

According to Del Giudice and Della Peruta (2016), knowledge transfer is the process through which a unit, person, group or department is affected by the experience of another. From a technocentric perspective, the transfer of knowledge will improve the experience, both for knowledge sharing and in terms of the aspects of creation and generation of new knowledge, resulting in gains in the management of knowledge maturity (Shu-Sheng et al., 2010). Some studies contextualize knowledge, within organizations, through the creation of a close relationship between knowledge, knowledge transfer, and organizational performance, in the sense that knowledge needs to be transformed into specific artifacts, aiming to influence business performance in a context of high technological turmoil and market dynamism (De Massis et al., 2016; Stock et al., 2013). The following hypothesis was thus established:

H3: Knowledge transfer influences the maturity of KM.

Absorptive Capacity and Maturity of Knowledge Management

Organizations are increasingly striving to create and transfer knowledge. Additionally, absorptive capacity is a special theoretical construct researchers typically use to describe a specific dynamic capability that helps firms to deal with external knowledge, create value and develop competitive advantages (Camison & Fores, 2010). When the need to examine the transfer and absorption of knowledge is recognized, a high degree of intensive knowledge makes activities developed in certain organizations even more complex (Huan et al. 2017). Due to the adherence of knowledge, the absorption process sometimes becomes arduous and difficult before it can become smooth and effective (Frank et al. 2014). In his work, Szulanski (1996) investigated the internal factors that impact the transfer and absorption of knowledge in organizations and, consequently, the maturity of their KM. Based on the above, the following hypothesis was established:

H4: Absorptive capacity influences KM maturity.

Maturity of Knowledge Management and Capacity for Innovation

Innovation can be conceptualized as a distributed process, which involves knowledge flows purposefully managed across organizational boundaries (Chesbrough & Bogers, 2014). Likewise, organizations accept this paradigm, aiming to manage the inflows and outflows of knowledge, to accelerate their internal innovation processes, as well as better explore the outputs of internal innovation efforts (Chesbrough, 2003; Chesbrough et al., 2006). Thus, the adoption of good KM practices becomes extremely important for innovation (Lichtenthaler, 2011; Tsai et al., 2015). Additionally, older or bigger companies may be more innovative because they tend to have more

sustainable business processes and long-term trusted external partnerships, as well as possessing more of the internal resources required by innovation processes (Cainelli et al. 2020). In this context, and considering the idea of the influence of the maturity of KM, in the aspect of organizational innovation capacity, the following hypothesis was formulated:

H5: The maturity of KM influences the innovation capacity in an organization.

The following theoretical research model (see Figure 1) is a correlation-based representation of the study's approach, rather than being causally based or using other valid correlations between the components shown.

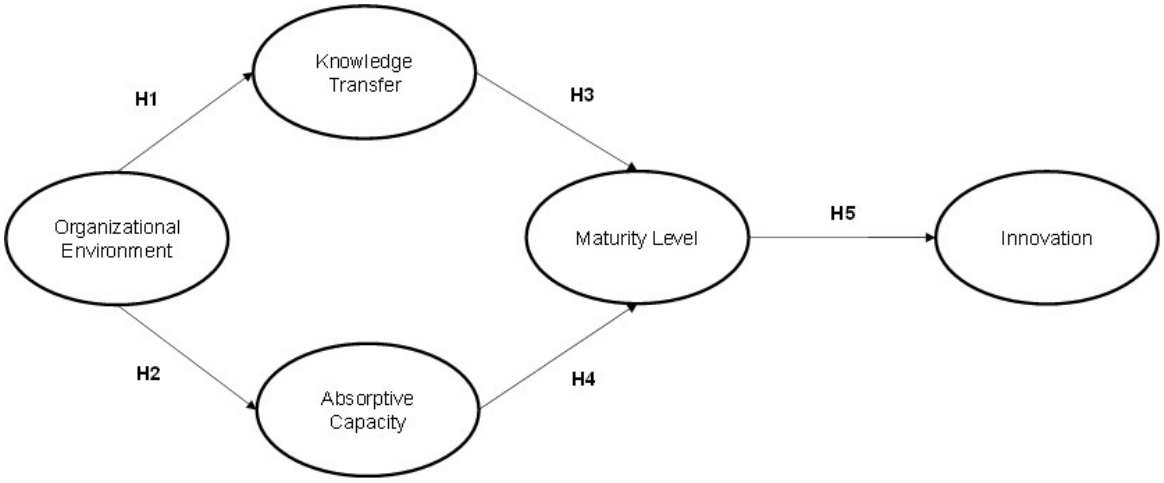

Figure 1. A model to verify the relationship between organizational environment, KM, and innovation capacity

Methodology

The present work is descriptive and utilizes a quantitative approach carried out via field research of the company Energisa (2013). The research sample, collected using Energisa (2013)'s Shared Services Center, is composed of approximately 1,000 employees and distributed among assistants, administrative workers, coordinators, managers, and directors. The sample was collected from 293 separate questionnaires with questions categorized in accordance with the constructs and dimensions involved in the study. Data were collected between May and August 2019 through a series of questions that comprised 74 of the 93 original questions: seven demographic questions, 16 questions related to the organizational environment according to the model proposed by Pee and Min (2017), three related to absorptive capacity, seven to knowledge transfer in accordance with the model proposed by Huan et al. (2017), 24 related to KM maturity, according to the model used by Batista (2016), and 17 questions inherent to innovation capacity, according to the model proposed by Mom et al. (2015). We have designed these questions to correlate to the elements of the main topic of the study and use a 7-point Likert Scale. Before fully administering the questionnaire, we double-checked its contents and subsequently given to a select group of people from the company to validate its results. The entire questionnaire is shown in Appendix 1.

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An evaluation of the quality of the measurement of the scales was performed according to procedures outlined in Netemeyer et al. (2003). Then, the exploratory data analysis was carried out, aiming at evaluating the characteristics of the data and verification of possible violations in the assumptions used, as well as providing information on the variables and general characteristics of the sample under study. Additionally, missing data, standard estimates, outliers, normality, linearity, multicollinearity, convergent validity and discriminant validity were verified. With the objective of evaluating and discussing the conditions and assumptions required in this study, as well as forecasting possible limitations and pitfalls regarding the interpretation of the results, applications such as SPSS 15.0 and SmartPLS were used following suggestions in the literature by Hair et al. (2021), Tabachnick and Fidel (2007), and Kline (2005). Partial Least Squares - Structural Equation Modeling (PLS-SEM) was then used to assess the relationship between the constructs. Through this process, the convergent validity, discriminant validity and dimensions of reliability and constructs were verified. Convergent validity ensures that the dimensions of the construct are sufficiently correlated to measure the concept addressed. Discriminant validity checks whether the constructs effectively measure different phenomenological aspects. Reliability, on the other hand, reveals the consistency of measurements in gauging the concept.

Results and Analysis

Regarding sociodemographic characteristics, 56.0% of the respondents were male and 44.0% were female. The age group was concentrated between the ages of 26 and 40 years old, with a breakdown of: 26-30 18.8%, 31-35 20.1%, and 36-40 19.8%. As for marital status, 63.1% of respondents were married. Most have their bachelor's degree (85.7%) or postgraduate education beyond the bachelor's degree (47.1%), and 48.1% have worked in the organization for between one and five years. The job titles of respondents were divided into: Analysts (37.5%), Administrative Assistants (22.5%), Executive Assistants (2.7%), Coordinators (14.7%), Managers/Directors (15.7%) and Administrative Technicians (6.8%). In addition, 93.5% of those interviewed had not taken sick leave in the last six months. In addition, it's important to emphasize that the sociodemographic characteristics were collected to allow for further exploration and additional studies that might explain different factors or perspectives concerning knowledge and innovation. Moreover, 77 of the 86 variables showed significant asymmetry, with 26 outside the limit of +1 or -1, a significant deviation in relation to the analyzed parameter (Muthén & Kaplan, 1992). Asymmetry was negative in 82 variables and positive in four others. 37 had significant kurtosis (33 outside the limits of +1 or -1), positive for 75 variables and negative for 11. For the Jarque-Bera Normality test, 83 variables were significant (96.5%), leading to a recommendation to apply a PLS estimation, given the significant deviation in the indicators. Analyzing Pearson's coefficient, a matrix was set up containing 3,655 non-redundant correlations, of which 2,750 were positive and significant and 115 were negative and significant, all above the limit of 0.11—which attests to the considerable adherence to the linearity of the proposed indicators. According to Kline (2005), the possibility of redundancy in the database exists when variables are highly correlated. To prevent this, it is necessary to check whether there are any correlations higher than 0.90 in absolute terms, which can be done via multicollinearity analysis.

Multicollinearity can be detected more easily in the Table 1, which shows that RGC_03, RGC_04, RGC_05 and RGC_06 present variance inflation measures (tolerance and VIF) greater than the

limit of 10. An alert about multicollinearity was found between variables KMR_03 and KMR_04, whose correlation was 0.93. The same occurred between KMR_05 and KMR_04 (0.86) and KMR_05 and KMR_06 (0.90).

Table 1. Multicollinearity Analysis

Item	Tolerance	VIF
NC_01	0.26	3.89
NC_02	0.25	3.98
NC_03	0.29	3.47
IN_01	0.24	4.16
IN_02	0.29	3.48
IN_03	0.23	4.26
IN_04	0.23	4.32
SV_01	0.27	3.67
SV_02	0.28	3.60
SV_03	0.41	2.47
TI_01	0.34	2.97
TI_02	0.21	4.81
TI_03	0.24	4.15
JA_01	0.19	5.39
JA_02	0.18	5.71
JA_03	0.19	5.39
ABC_01	0.50	2.01
ABC_02	0.42	2.36
ABC_03	0.46	2.17
KTW_01	0.18	5.58
KTW_02	0.19	5.28
KTW_03	0.35	2.83
KTW_04	0.29	3.41
KTA_01	0.24	4.16
KTA_02	0.22	4.46
KTA_03	0.34	2.98
TEC_01	0.22	4.57
TEC_02	0.16	6.11
TEC_03	0.19	5.25
TEC_04	0.21	4.88
TEC_05	0.28	3.60
TEC_06	0.27	3.75
KPROC_01	0.19	5.39
KPROC_02	0.20	5.03
KPROC_03	0.23	4.38
KPROC_04	0.41	2.43
KPROC_05	0.17	5.74
KPROC_06	0.16	6.27
LIN_01	0.18	5.49
LIN_02	0.22	4.65
LIN_03	0.23	4.41
LIN_04	0.20	5.06
LIN_05	0.16	6.29
LIN_06	0.18	5.62

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KMR_01	0.16	6.29
KMR_02	0.16	6.16
KMR_03	0.08	12.93
KMR_04	0.07	13.46
KMR_05	0.08	11.97
KMR_06	0.09	11.83
IA_01	0.15	6.75
IA_02	0.14	7.16
IA_03	0.29	3.50
IA_04	0.38	2.64
PROX_01	0.34	2.97
TRU_01	0.28	3.57
TRU_02	0.24	4.25
GALM_03	0.52	1.93
GALM_04	0.55	1.81
GALM_01_i	0.41	2.42
GALM_02_i	0.41	2.46
KAC_01	0.29	3.49
KAC_02	0.21	4.72
KAC_03	0.19	5.31
KAC_04	0.19	5.26
KAC_05	0.25	4.06
KAC_06	0.24	4.20

Note: Tolerance indicates an explanatory variable's proportion of variation that is independent of other explanatory variables; VIF (Variance Inflation Factor) measures how much the variable is inflated by its collinearity.

Because of this, it was decided to exclude RGC_03 and RGC_06, which solved the problem, which is shown in Table 2.

Table 2. Multicollinearity Analysis After Excluding Variables

Item	Tolerance	VIF
KMR_03	0.08	12.93
KMR_04	0.07	13.46
KMR_05	0.08	11.97
KMR_06	0.09	11.83
KMR_01	0.16	6.17
KMR_02	0.17	6.04
KMR_04	0.13	7.94
KMR_05	0.13	7.58

Note: Tolerance indicates an explanatory variable's proportion of variation that is independent of other explanatory variables; VIF (Variance Inflation Factor) measures how much the variable is inflated by its collinearity.

Table 3 shows the feasibility of the proposed model. The results indicate that all constructs and dimensions had an Average Extracted Value (AEV) greater than 0.5, confirming convergent validity across the board. Additionally, Cronbach's Alpha (CA) and Composite Reliability (CR) values exceeded 0.7 for all but two constructs, which recorded values of 0.62 and 0.63. These lower figures could be considered a limitation of the study. However, according to Hair et al. (2021), while higher internal consistency reliability (measured by CR and CA) suggests stronger reliability, values between 0.60 and 0.70 are acceptable for exploratory research. Values between

0.70 and 0.90, on the other hand, indicate reliability ranging from 'satisfactory' to 'good,' suggesting that the reliability in this study remains acceptable. Factor analysis conducted uysing SmartPLS adjustment was adequate for all dimensions and constructs, as well as Kaiser-Meyer-Olkin (KMO) values, always above 0.5. Finally, all dimensions considered and belonging to the constructs were one-dimensional, except for technology, which proved to be two-dimensional. Besides this, the dimension goal alignment also is two-dimensional, besides having commonalities, according to its factor analysis, so it needed to be extracted of innovation capacity. Table 3 shows the results for convergent validity, reliability, and dimensionality of the main constructs and their dimensions adapted for the model:

Table 3. Reliability, Convergent Validity, and Dimensionality

Second Order Constructs	Items	AEV[1]	CA[2]	CR[3]	KMO[4]	Dim.[5]	MSV[6]
01-Innovation Capacity	13	0.55	0.72	0.83	*	4	0.63
01.1-Innovation Activities	4	0.70	0.86	0.90	0.4	1	0.37
01.2-Proximity	1	1.00	1.00	1.00	*	1	0.63
01.3-Trust	2	0.85	0.82	0.92	0.50	1	0.62
01.5-Knowledge Acquisition	6	0.69	0.91	0.93	0.87	1	0.61
02-Maturity Level	20	0.77	0.90	0.93	*	4	0.85
02.1-Technology	4	0.57	0.75	0.84	0.70	2	0.67
02.2-Knowledge Processes	6	0.68	0.90	0.93	0.86	1	0.85
02.3-Learning and Innovation	6	0.72	0.92	0.94	0.91	1	0.82
02.4-KM Results	4	0.83	0.93	0.95	0.83	1	0.82
03-Absorptive Capacity	3	0.57	0.63	0.80	0.64	1	0.23
04-Knowledge Transfer	7	0.73	0.62	0.84	*	2	0.74
04.1-Knowledge Transfer Willingness	4	0.68	0.84	0.89	0.73	1	0.74
04.2-Knowledge Transfer Ability	3	0.75	0.83	0.90	0.68	1	0.72
05- Organizational Environment	16	0.54	0.78	0.85	*	5	0.67
05.1-Norm of Collaboration	3	0.73	0.81	0.89	0.68	1	0.61
05.2-Innovativeness	4	0.73	0.88	0.92	0.83	1	0.67
05.3-Skill Variety	3	0.75	0.83	0.90	0.70	1	0.40
05.4-Task Identity	3	0.78	0.86	0.91	0.69	1	0.51
05.5-Job Autonomy	3	0.86	0.92	0.95	0.76	1	0.51

Note: [1] Average Extraction Variance; [2] Cronbach's Alpha; [3] Composite Reliability; [4] Measurement of Suitability of the Kaiser-Meyer-Olkin sample; [5] Dimensionality; [6] Maximum Share Variance between second order factors; *Not computable.

Discriminant validity can be understood as the degree to which the measurements of different constructs have correlations that corroborate the premise that both represent different factors (Netemeyer et al., 2003). Usually, discriminant validity is obtained when measurements do not correlate at excessively high levels, which indicate that the constructs measure the same concept (Malhotra et al., 2007). To analyze the discriminant validity, the method suggested by Fornell and Larcker (1981) was used. This method consists of comparing the average variance extracted from the constructs with the variance shared between the theoretical constructs (R^2 obtained through the correlation of the estimated scores).

However, discriminant validity is violated if the construct explains the variability of another construct more than of itself (R^2 > AEV), except for the second order factors and subdimensions, as can be seen in the table IV.

Table 4. Assessment of discriminant validity and overall measurement quality

Constructs	01	02	03	04	05
01-Innovation Capacity	**0.55**	0.47	0.33	0.43	0.53
02-Maturity Level	0.22	**0.77**	0.32	0.36	**0.65**
03-Absorptive Capacity	0.11	0.11	**0.57**	0.48	0.38
04-Knowledge Transfer	0.18	0.13	0.23	**0.73**	0.32
05- Organizational Environment	0.28	0.43	0.15	0.10	**0.54**
AVE	**0.55**	0.77	**0.57**	0.73	**0.54**
CC	0.83	0.93	0.80	0.84	0.85
AC	0.72	0.90	0.63	0.62	0.78

Note: The diagonal is AEV. Above the diagonal are the correlations between the constructs. The squared correlations are below the diagonal (R^2). CC ≥ 0,60; AEV ≥ 0,50; CA ≥ 0,60.

All main indicators reached levels above the minimum desirable for AVE, CC and AC. In addition, there was no violation of discriminant validity. It can be attested that all the main indicators represent different dimensions from each other (Malhotra et al. 2007).

Table 5 uses the method suggested by Fornell and Larcker (1981), presenting the analysis of the measurement constructs and models, convergent validity, discriminant validity, dimensionality, and reliability dimensions.

Table 5. The Measurement Model Validation

First Order Constructs	Items	AEV[1]	CA[2]	CR[3]	Dim.[4]	MSV[5]
01-Innovation Capacity	13	0.55	0.72	0.83	4	0.28
02-Maturity Level	20	0.77	0.90	0.93	4	0.43
03-Absorptive Capacity	3	0.57	0.63	0.80	1	0.23
04-Knowledge Transfer	7	0.73	0.62	0.84	2	0.23
05- Organizational Environment	16	0.54	0.78	0.85	5	0.45

Note: [1] Extraction Variance; [2] Cronbach's Alpha; [3] Composite Reliability; 4 Dimensionality, 5 Maximum Share Variance between First Order Factors.

The cutoff point suggested by Hair et al. (2017) was at least 0.60 for CR, 0.50 for AEV and 0.60 for CA. Thus, it can be asserted that each main indicator represents a different dimension (Malhotra et al. 2007). Next, the structural model of the study is presented in Figure 2, resulting from the application of the structural equation modeling technique with the estimation by Partial Least Squares (PLS) (Haeinlein & Kaplan, 2004).

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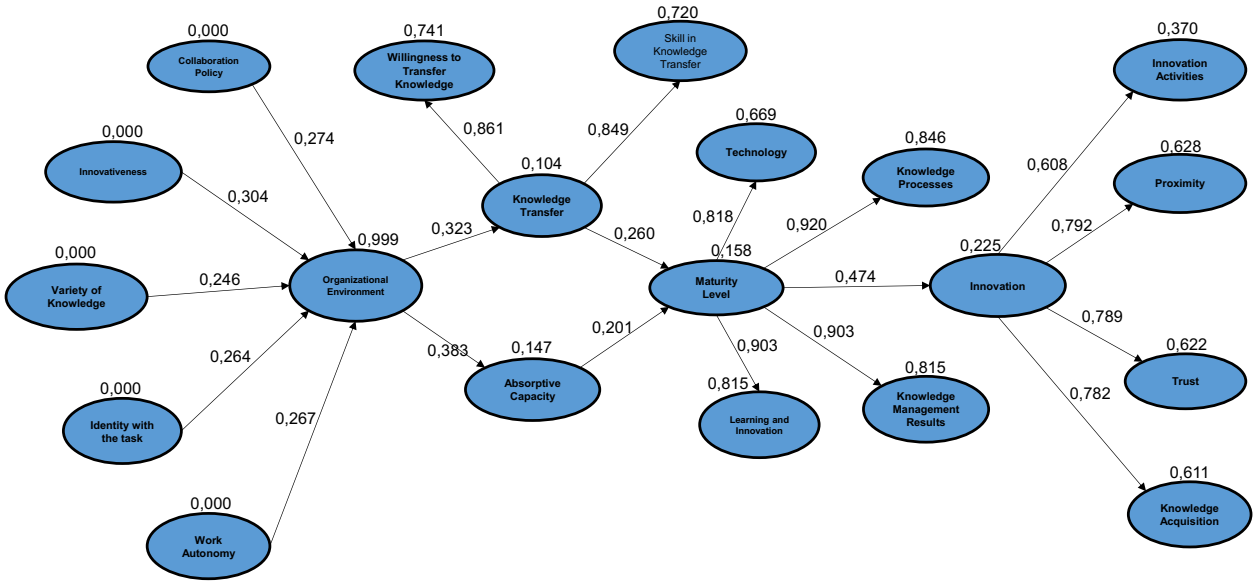

Figure 2. Complete Main Model: Standardized Weights and R2 in PLS

According to Hair et al. (2014), the indicator Goodness-of-fit (GoF) should be used to verify how well the model reproduces the covariance matrix observed between the items indicated by multiple regression (that is, the similarity between the observed and estimated covariance matrices). Once a specific model has been estimated, model fit compares the similarity between theory and reality through evaluating the similarities of the estimated and actual matrices of covariance. In the case of a perfect theory, the matrices would be identical, i.e., the GoF value would be 100%. In PLS, GoF is obtained by taking the geometric mean between AVEs of the constructs and the R^2 of the model, which also ranges from 0-100%.

$$GOF = \sqrt{AVE\ average\ x\ R^2\ average}$$

It is important to note that the GoF calculated by the geometric mean in PLS cannot discriminate between valid and invalid models but is still useful for making future comparisons of the adherence of different samples to the model and to unify the AVE and R^2 into a single measure. For the present study, GoF was calculated via geometric mean, which indicated that 55% of the overall variability of the data is explained by the proposed predictive model. In Table 6, the results of the structural model are illustrated:

Table 6. Structural Model Results

Endogenous	Exogenous	β	T	SE(β)²	CI-95%	P-value	R²
01.1-Innovation Activities	01-Innovation Capacity	0.61	8.78	0.07	0.47 ↔ 0.75	0.000	0.22
01.2-Proximity		0.79	30.22	0.03	0.73 ↔ 0.85	0.000	
01.3-Trust		0.79	24.45	0.03	0.73 ↔ 0.85	0.000	
01.5-Knowledge Acquisition		0.78	20.03	0.04	0.7 ↔ 0.86	0.000	
02.1-Technology	02-Maturity Level	0.82	34.24	0.02	0.78 ↔ 0.86	0.000	0.15
02.2-Knowledge Processes		0.92	104.45	0.01	0.9 ↔ 0.94	0.000	

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Accepting Editor: Meir Russ

02.3-Learning and Innovation		0.90	61.65	0.01	0.88 ↔ 0.92	0.000	
02.4-KM Results		0.90	71.71	0.01	0.88 ↔ 0.92	0.000	
04.1-Knowledge Transfer Willingness	04-Knowledge Transfer	0.86	65.10	0.01	0.84 ↔ 0.88	0.000	0.29
04.2-Knowledge Transfer Ability		0.85	48.50	0.02	0.81 ↔ 0.89	0.000	
05.1-Norm of Collaboration	05-Organizational Environment	0.27	20.10	0.01	0.25 ↔ 0.29	0.000	1.00
05.2-Innovativeness		0.30	19.42	0.02	0.26 ↔ 0.34	0.000	
05.3-Skill Variety		0.25	14.25	0.02	0.21 ↔ 0.29	0.000	
05.4-Task Identity		0.26	18.93	0.01	0.24 ↔ 0.28	0.000	
05.5-Job Autonomy		0.27	15.22	0.02	0.23 ↔ 0.31	0.000	
02- Maturity Level	01-Innovation Capacity	0.47	8.28	0.06	0.35 ↔ 0.59	0.000	0.22
03-Absorptive Capacity	02-Maturity Level	0.20	2.85	0.07	0.06 ↔ 0.34	0.000	0.15
04-Knowledge Transfer		0.26	3.73	0.07	0.12 ↔ 0.4	0.000	
05-Organizational Environment	03-Absorptive Capacity	0.38	6.34	0.06	0.26 ↔ 0.5	0.000	0.12
05-Organizational Environment	04-Knowledge Transfer	0.32	5.27	0.06	0.2 ↔ 0.44	0.000	0.29

Note: [1] β is the standardized weight; [2] T is the value of t; [3] SE(β) is the standard error; [4] CI-95% is the confidence interval given by β ± 1,96* SE(β); [5] P-value is the significance of T for the 293 sample cases for a two-tailed test and [6] R^2 is the R Squared (measure of fit of the statistical model). According to Hair (2014), R^2 is the coefficient of determination and is defined as the sum of squares due the regression divided by the sum of total squares (usually interpreted as representing the percentage of variation in the dependent variable explained by variation in the independent variables.

In the relationship between the Organizational Environment and Knowledge Transfer (H1), there is a significant (P-value = 0.001) and positive (β = 0.32 [0.2; 0.44]) influence, meaning that the Organizational Environment has a positive and direct influence on Knowledge Transfer. The results corroborate the studies carried out by AlShamsi and Ajmal (2018), who articulated several aspects inherent to the organizational environment, identifying critical factors that have an impact on knowledge sharing. Additionally, in the work of Pee and Min (2017), several individual and environmental factors were identified as influencing knowledge sharing; similarly, their questionnaire is an integral part of this work. It can be inferred, in the context of the studied organization, that the Organizational Environment directly favors the exchange of information among the company's employees, constituting an important foundation for the circulation of knowledge. The results help to complement and enrich the studies carried out on the subject, attesting to Environmental Factors as a powerful factor of influence in the circulation of knowledge. According to these results, considering the importance of knowledge transfer emphasized by several sources in this article, it would not be incorrect to state that better management of the organizational environment can help improve performance. Similarly, it is observed that the Organizational Environment has a significant (P-value = 0.001) and positive (β = 0.38 [0.26; 0.5]) influence on Absorptive Capacity, supporting the hypothesis that the Organizational Environment positively influences Knowledge Absorption. The results found the influence takes place in a positive and direct way, confirming H2.

Analyzing some works such as Indarti (2010), it is noted that Knowledge Absorption is extremely important in organizations, with Absorptive Capacity being an essential element to the organizational environment regarding the use of acquired knowledge, both internally and externally, in order to promote mechanisms of engagement and innovative growth (Pennings &

Harianto, 1992; Jorna, 2017). Significant (P-value = 0.001) and positive (β = 0.26 [0.12; 0.4]) influence regarding Knowledge Transfer on KM Maturity is also observed, attesting to the initial hypothesis H3. This corroborates analyses carried out in previous work, confirming the statement that success in knowledge transfer allows an organization to make good use of it for its development, something that can be measured when approaching the maturity of its management (Argote & Ingram, 2000). For H4, looking at the influence exerted by Absorptive Capacity on the Maturity of KM, the initial hypothesis has been confirmed with significant (P-value = 0.001) and positive influence (β = 0.2 [0.06; 0.34]). Corroborating these results, Teece et al. (1997) state that organizations should use their absorptive capacity aiming at strategic adjustment oriented to respond adequately to an environment of rapid changes, which demonstrates their maturity in KM, in addition to reinforcing the need for dynamic KM (Simsek & Heavey, 2011). Finally, the influence of KM Maturity on Innovation Capacity in the researched company was analyzed. This relationship was significant (P-value = 0.001) and positive (β = 0.47 [0.35; 0.59]), confirming H5 and going against the work of Heisig *et al.* (2016), according to which KM needs to use intellectual capital as a resource aimed at producing value and superior performance to organizations, which implies innovation itself. In addition to these research articles, Davenport and Prusak (1998) inferred that the maturity of KM, identified through the creation, transfer, absorption and application of the company's knowledge base, is directly related to innovation capacity and must be linked to getting and sustaining competitive advantage. The results found refer to the company's focus on benefiting from maturity in KM, aiming to provide, in various areas, innovation. This, in turn, is not limited to only new products, but to a wider range that includes services, processes and people this can also be seen in the responses to the questionnaire used for this research. In view of the results, all the hypotheses tested can be confirmed.

Implications for Theory and Practice

This research presents both practical and theoretical contributions. From a theoretical perspective, it examined the relationships between the organizational environment, KM, and innovation capacity. Regarding the influence of the organizational environment on the transfer of knowledge and absorptive capacity, the results confirmed the hypotheses tested, enriching the work carried out by Pee and Min (2017) by contributing research about a different type of company. Likewise, considering the relationships between absorptive capacity and knowledge transfer on the maturity of KM, both situations presented a positive and significant relationship, confirming the concept about the value of creating and disseminating knowledge (Shu-Sheng et al., 2010). In addition to the aforementioned relationships, a positive and significant relationship between the maturity of KM and the capacity for innovation in an organization was also confirmed. Such findings helped to corroborate the research by Wang et al. (2017) about innovation in organizations, considering the influence of their absorptive capacity, as well as other factors inherent to the maturity of KM, on innovation capacity within an organization. Regarding the practical implications, the study gives a good overview of the impact of the dissemination of organizational knowledge. That is, when analyzing the scenario studied, a direct and positive relationship becomes clear between the studied constructs, maturity in KM, and, in turn, innovation capacity. In addition, making inferences about the organizational environment, when there exists favorable conditions and a constructive environment that promote growth (e.g., Energisa, 2013), KM tends to foster an

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increase in organizational maturity, raising the levels of knowledge transfer and absorption, which will culminate in an increase in innovative capacity.

Final Considerations

The main objective of this work, which was to analyze the relationship between the organizational environment, KM, and innovation capacity, came from suggestions for studies proposed in the works of Pee and Min (2017), Wang et al. (2017), Huan et al. (2017), Khraishi et al. (2023) among others. To accomplish this, exploratory factor analysis and structural equation modeling were used on a group of constructs that tested interrelationships. Considering KM and the influence of knowledge transfer on KM maturity, this work shows that close relationships between employees operating in an incremental, dynamic way, in a disruptive environment, through the profusion of data, information, the circulation of knowledge, and competence, tend to produce organizational intelligence, as well as excellence and sustainability, translating to good management of knowledge maturity. On the other hand, analyzing the maturity of KM and focusing on its influence on innovation capacity in the researched company, a direct and positive relationship identified through the organizational strategy between both can be verified. In view of the relationships studied, it is necessary to emphasize the relationships between the organizational environment and absorptive capacity on the one hand, and between absorptive capacity and KM maturity on the other. In both situations, positive and significant relationships were validated, which reminds us of the importance of approaching this construct and the conceptual details of these relationships in future exploratory studies. Another path to take would be exploring their opposition to knowledge adherence, specifically regarding the negative aspect of the latter. Therefore, when we focus on the theoretical implications of this work, analyzing the knowledge transfer and absorptive capacity constructs, the influence of environmental factors on these elements is in evidence, as well as their influence on the maturity of KM, and this, in turn, on the organization's ability to innovate. Such findings corroborate and complement research previously carried out by some researchers, including AlShamsi and Ajmal (2018), Del Giudice and Della Peruta (2016), Ren et al.(2018), Tsai et al.(2015) and Heisig et al. (2016).

In general, there is a need for new studies that can explore the concepts discussed here. As suggestions for further work, it would be interesting to focus on evaluations related to different organizational contexts, both private and public, exploring industrial and commercial environments as well as educational and scientific ones, for example. Furthermore, with regard to the organizational environment, specific factors could be addressed such as organizational leadership's influence on KM in terms of knowledge transfer and absorptive capacity. From a practical perspective, other aspects have become important and must be elucidated. Among them, we emphasize the importance of the topic of KM with regard to the development and survival of companies. This aspect has been shown to be an asset for organizations, so that its correct use reveals different levels of maturity in KM. Moreover, access to and proper treatment of information, in various circumstances, allows companies to meet challenges skillfully and dynamically, seeking the innovation and continuous development that will allow them to thrive on the market.

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In addition to the above implications, this study encompasses a further philosophical perspective. The nature of science is understood as a set of elements that deal with the construction, establishment and organization of scientific thinking. This can range from internal issues, such as the scientific method and the relationship between experiment and theory, to external ones, such as the influence of social, cultural, religious and political elements on the acceptance or rejection of scientific ideas. In this way, the importance of the history and philosophy of science has been highlighted as one of the ways to promote a better understanding of the nature of science because its historiographical studies bring together elements that support discussions about the genesis of scientific knowledge and its internal factors and external influences. Considering the vast framework of the literature on KM and the existence of studies that correlate numerous constructs discussed within this research, it seems as though the basis of this knowledge already has a reasonable level of maturity and consolidation.

The research techniques used here were based on concepts normally applied in research in this area and whose approach was given through the application questionnaires tested and refined by other scholars. This line of research considered three elements of paramount importance in administration: the organizational environment (addressed in general terms), KM (contemplating the constructs absorptive capacity, knowledge transfer and KM maturity) and innovation (considering innovation capacity). The observed results demonstrate that KM needs to be thoroughly evaluated, so that its elements are effectively dissected and carefully analyzed. In this vein, the organizational environment, in turn, must be approached in a more specific way to bring out the particulars of each of its constituent elements when evaluated and correlated with the other elements of administration. Similarly, the KM approach can be carried out considering its numerous elements, as well as various possibilities of correlations and combinations of processes, from generation to aspects that include transfer, adherence, absorptive capacity, among others. The analysis of the results shows that managers and administrators can pay special attention to these constructs in order to master the aspects inherent to their interrelationships. This will provide companies with a better view of their effects and impact and thus allow decision-making that favors the improvement of administrative processes, in search of better results through improved performance and increased capacity for innovation. Finally, an important observation is that this study is based on data from a single company, which limits the general applicability of the findings, although the model used could generate insights on how the elements correlate within the framework of the whole.

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Appendix 1. Survey Instrument

Constructs	Dimensions	Code ID	Description
Descriptives	Descriptives	DESC_01	Gender
		DESC_02	Age Group
		DESC_03	Marital Status
		DESC_04	Schooling
		DESC_05	Company Time
		DESC_06	Current Role
		DESC_07	Leave for Health Reasons in the last six months
Organizational Environment	Norm of Collaboration (CP)	NC_01	The norm of collaboration in my organization is at a level that is...
		NC_02	The norm of teamwork in my organization is at a level that is…
		NC_03	The norm of rewarding employees for joint accomplishments is at a level that is…
	Innovativeness (IN)	IN_01	The extent to which my organization values creativity is…
		IN_02	The extent to which my organization facilitates learning is…
		IN_03	The extent to which my organization is open to conflict view is…
		IN_04	The extent to which my organization is willing to take risks to experiment with new ideas is…
	Skill Variety (VC)	SV_01	The extent to which my job requires skill variety is…
		SV_02	The extent to which my job requires the use of a number of complex or high-level skills is…
		SV_03	The extent to which my job is complex and non-repetitive is…
	Task Identity (TI)	TI_01	The extent to which my job involves completion of a whole and identifiable piece of work is…
		TI_02	The extent to which my job provides chances to completely finish the pieces of work I begin is…
		TI_03	The extent to which my job involves job arrangements that allow me to do an entire piece of work from beginning to end is…
	Job Autonomy (JA)	JA_01	The extent to which my job has job autonomy is…
		JA_02	The extent to which my job offers independence and freedom in doing the work is…
		JA_03	The extent to which my job provides chances to use my personal initiative and judgment in carrying out work is…
Absorptive Capacity	Absorptive Capacity	ABC_01	The extent to which you take time to explain experience and know-how to your colleagues is…
		ABC_02	The extent to which you think about and design how to explain experience and know-how is…
		ABC_03	The extent to which you communicate to your colleagues to explain experience and know-how is…
Knowledge Transfer	Knowledge Transfer Willingness (KTW)	KTW_01	Sharing my experience and know-how with my colleagues is something worth doing.
		KTW_02	Sharing my experience and know-how with my colleagues is happy thing.
		KTW_03	In daily work, I will take the initiative to share with my colleagues my experience and know-how.
		KTW_04	I will try my best to help them using my experience and know-how when colleagues encounter technical difficulties.
	Knowledge Transfer Ability (KTA)	KTA_01	I clearly know the knowledge that colleagues need when they face the technical difficulties.
		KTA_02	I can clearly express the knowledge that colleagues need when they face the technical difficulties.
		KTA_03	I can transfer my experience and know-how to colleagues speedy when they face the technical difficulties.
Maturity Level	Technology (TEC)	TEC_01	Upper management has implemented an IT infrastructure and the necessary structure to facilitate the Knowledge Management.

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		TEC_02	The IT infrastructure is aligned with the Knowledge Management of the organization.
		TEC_03	Every employee of the organization has access to a computer.
		TEC_04	Every employee of the organization has internet/intranet access and an e-mail address.
		TEC_05	The available information on the website is regularly updated.
		TEC_06	The intranet (or a similar network) is used as the main communication source within the organization for knowledge transfer and information sharing.
	Knowledge Processes (KPROC)	KPROC_01	The organization has systematic processes for identifying, creating, storing, sharing and using knowledge.
		KPROC_02	The organization has a knowledge map and distributes knowledge assets or resources throughout the unit.
		KPROC_03	The knowledge acquired after performing tasks and completing projects is recorded and shared.
		KPROC_04	The essential knowledge of employees leaving the organization is retained.
		KPROC_05	The organization shares best practices and lessons learned with the employees to avoid redoing work.
		KPROC_06	Benchmarking activities are carried out inside and outside departments. The results are used to improve organizational performance and develop new knowledge.
	Learning and Innovation (LIN)	LIN_01	The organization continuously articulates and reinforces values such as learning and innovation.
		LIN_02	The organization considers taking risks and/or making mistakes learning opportunities, as long as they do not happen repeatedly.
		LIN_03	Cross-functional teams are formed to solve problems or deal with worrisome situations that occur in different management units of the organization.
		LIN_04	People feel that they are given autonomy by their hierarchical superiors and that their ideas and contributions are generally valued by the organization.
		LIN_05	Middle managers are willing to use new tools and methods.
		LIN_06	People are encouraged to work together and share information.
	Knowledge Management Results (KMR)	KMR_01	The organization has a successful track record in implementing Knowledge Management and other initiatives for change, which can be proven with performance indicator results.
		KMR_02	Indicators are used to assess the impact of Knowledge Management contributions and initiatives on the organization's results.
		KMR_03	The organization has improved thanks to the contributions and initiatives of Knowledge Management and its results regarding the quality indicators of products and services.
		KMR_04	The organization has improved thanks to the contributions and initiatives of Knowledge Management and its results related to efficiency indicators.
		KMR_05	The organization has improved thanks to the contributions and initiatives of Knowledge Management and its results related to social effectiveness indicators.
		KMR_06	The organization has improved thanks to the contributions and initiatives of Knowledge Management and its results regarding general indicators.
Innovation Capacity	Innovation Activities (IA)	IA_01	In the previous year, to what extent did you search for new possibilities in relation to work-related services/processes or markets?
		IA_02	In the past year, to what extent did you assess various options regarding work-related services/processes or markets?
		IA_03	In the previous year, to what extent did you carry out activities that required you to learn new skills or knowledge related to work?
		IA_04	In the past year, to what extent have you carried out work-related activities that are not clearly part of your job description?
	Proximity (PROX)	PROX_01	In the past year, how close was your working relationship with your team?
	Trust (TRU)	TRU_01	Colleagues on my team are generally honest and truthful when providing information to me.

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		TRU_02	The people from my department are very competent in the areas in which we interact.
	Goal Alignment (GALM)	GALM_01	I do "my own thing" on my team.
		GALM_02	On my team, I work towards my individual goals.
		GALM_03	I like to receive rewards for my contribution to teamwork as a whole.
		GALM_04	I'm more concerned with what my team accomplishes as a group.
	Knowledge Acquisition (KAC)	KAC_01	In the past year, to what extent have you gained professional knowledge and experience from your teammates?
		KAC_02	In the past year, to what extent have you gained insight into new market developments and technology trends from your teammates?
		KAC _03	In the past year, to what extent have you gained personal experience in management techniques from your teammates?
		KAC _04	In the past year, to what extent did you acquire explicit knowledge from your teammates?
		KAC _05	In the past year, to what extent did you acquire procedure manuals or technical manuals from your teammates?
		KAC _06	In the past year, to what extent did you acquire written knowledge about management techniques from your teammates?

Authors Biographies

Francisco Ferreira da Silva Neto, M.A., M.B.A. is an Electrical Engineer and Telecommunications Specialist. His expertise includes providing management information on network performance and other indicators regarding quality, schedule, and cost control acting in Mobile Systems implementation, Project Development based on PMBOK, and IT and Telecommunications Team Management. He is pursuing research projects on knowledge management, innovation, and organizational strategy.

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