IJCG | IBEROAMERICAN JOURNAL OF CORPORATE GOVERNANCE
REVISTA DE GOVERNANÇA CORPORATIVA

Alumni.in
PUBLISHER

ISSN: 2359-313X v.9, n.1, 2022 https://iberoamericancg.org

Guest Paper

Product Innovation: Path to Sustainable Competitive Advantage with *Use of Environmental, Social and Governance Principles*

Julio Cesar Ferro De Guimarães *[A], Eliana Andréa Severo [A] and Eric Charles Henri Dorion [B]

[A] Department of Administration, University Federal de Pernambuco, UFPE, Recife/PE, Brazil

[B] Department of Accounting and Finance, École de Technologie Supérieure ÉTS, Montreal, Canadá

Editorial Details

Double-blind review System

Article history Received: 28 Jun., 2022

Reviewed: 28 Jun., 2022

Accepted: 28 Jun., 2022

JEL CODE: H11, H12, R51

Editor-in-Chief
Altieres de Oliveira Silva, Ms.
Alumni.In. Editors

Cite as:

De Guimarães, J. C. F., Severo, E. A., & Dorion, E. C. H. (2022). Product Innovation: Path to Sustainable Competitive Advantage with Use of Environmental, Social and Governance Principles. **Iberoamerican Journal of Corporate Governance**, 9(1), e117.

Authors' contact:

* Julio Cesar Ferro de Guimarães
julio.cfguimaraes@ufpe.br

Abstract

Purpose of the study: This study aims to analyze the relationship between product innovation and strategic resources used by the furniture enterprises, under the perspective of sustainable competitive advantage, with the intention to identify the resources previous to innovation.

Methodology/approach: The method used in this research is a quantitative and descriptive study, through a survey, applied to 1067 companies in Brazilian furniture industry. The data analysis occurred through Structural Equation Modeling.

Originality/Relevance: Product innovation and strategic resources are capable of providing great potential for economic transformation. It is strategically acknowledged that there is a relationship between product innovation and the use of resources, however, there are as yet insufficient empirical studies to determine which resources influence product innovation. Another important aspect is to evaluate the influence of Environmental, Social and Governance sustainability precepts in the development of new products.

Key findings: In the empirical study, noticed that Product Innovation results from the use of resources, which configures innovation antecedents.

Theoretical/methodological contributions: This study contributes the advancement of science, which can be used to analyze the antecedents of Product Innovation, which pointed out that companies with strategic resources can expand the capacity of innovation by generating sustainable Product Innovation, which leads to the success of a new product.

Social contributions/to management: This study can contribute to managerial decisions, as the results indicate that the Success in New Product Development proved to be an essential form of competitive advantage, comparing the results of Product Innovation with competitors and relating this performance to the use of Environmental, Social and Governance principles.

Keywords: Product Innovation, Sustainable Competitive Advantage, Furniture Industry, Structural Equation Modeling, Brazil.

https://doi.org/10.21434/IberoamericanJCG.v9i1.117

1. Introduction

In the organizations' study, the competitiveness between enterprises has gained its spotlight in literature, whether it is to explain the phenomenon of higher growth in a company about its industry or to generate a sustainable competitive advantage. The search for a competitive advantage widened the importance for the organization, with the consolidation of globalized markets, demanding from the enterprises the optimization of resources usage and product innovation. In this scenario, the companies search for means to administer their resources, considering the market context.

To improve the resources usage, by competitively offering products and services, the enterprises search for innovation as a way of maintenance and market growth. Chesbrough (2003) contributed to the discussion when he stated that the globalization phenomenon generates a growing need for products and services differentiation.

Innovation actively contributes to the social-economic development of a company and a region (Severo et al., 2017), but it is necessary that the organization adopts innovation as part of its strategy, and that this is linked to a sectorial pattern of technological and innovative behavior for economic sustainability, through the adequate usage of its resources.

In the development process of product innovation, the enterprises developed tangible and intangible strategic resources (Barney, 1991a; 1991b; De Guimarães et al., 2016). In this sense, the strategic resources are elements which belong to the enterprise and generate value to the organization, with which the enterprise can develop strategies to keep or maintain a given market competitive position. From the Resource-Based View (RBV) perspective, the resources are relevant for the study and are based on the premise that they are, whether individually or combined, able to generate a competitive advantage and can be related to product innovation.

The central theme of this research is centered on product innovation and strategic resources under the RBV (Barney, 1991a; 1991b), on a perspective that these may become generating income of sustainable competitive advantage. According to Guan and Ma (2003), sales growth, especially when it comes to exportation, are intimately related to the total improvement of innovation capacity dimensions.

As a source of regional development, product innovation is an essential factor, together with the strategic resources which can generate differentials for the furniture industry in Brazil. The resources, as innovation predecessors, can contribute to the industry's superior performance. Therefore, this research investigates the relationships between strategic resources and product innovation. According to this, we identified the research problem which is related to the following questions: i) are the resources used in the furniture enterprises positively related to product innovation?; ii) what is the contribution of product innovation to generating a sustainable competitive advantage in the furniture enterprises?

This research was done in the furniture industry in the state of Rio Grande do Sul (RS) and in the state of Rio de Janeiro (RJ), Brazil (Figure 1). According to MOVERGS (2022) Brazil is one of the largest furniture producers in the world and the largest in Latin America. There are more than 240 thousand direct jobs in more than 21 thousand companies, which in 2020 had an estimated production value of approximately US$ 11.8 billion, and with regard to the foreign market, Brazil is the 31st largest exporter of furniture in the world, with exports of USD 679.1 million in 2020.

In the furniture sector, innovation boosted by customers. These innovations, along with the suppliers' participation, are frequently incremental and non-radical (O'Connor et al., 2002; Garcia & Calantone, 2002; Chesbrough, 2003; Huizingh, 2011). In this sense, developing research which enables understanding how these aspects of product innovation linked to better results, may contribute to encouraging the enterprises to create new products and technologies to widen their competitive advantage sustainable, like organizational performance.

From this context, this study aims to analyze the relationship between product innovation and strategic resources used by the furniture enterprises, under the perspective of sustainable competitive advantage, with the intention to identify the resources previous to innovation. The research hypotheses measure the influence relation of strategic resources (Information System, Human Resources, Knowledge Management, Alliance) on Product Innovation results and New Product Development Success. This study also contributes to measuring the influence of Environmental, Social and Governance (ESG) precepts on Product Innovation (PI) and New Product Development Success (NPDS), in achieving sustainable competitive advantage.

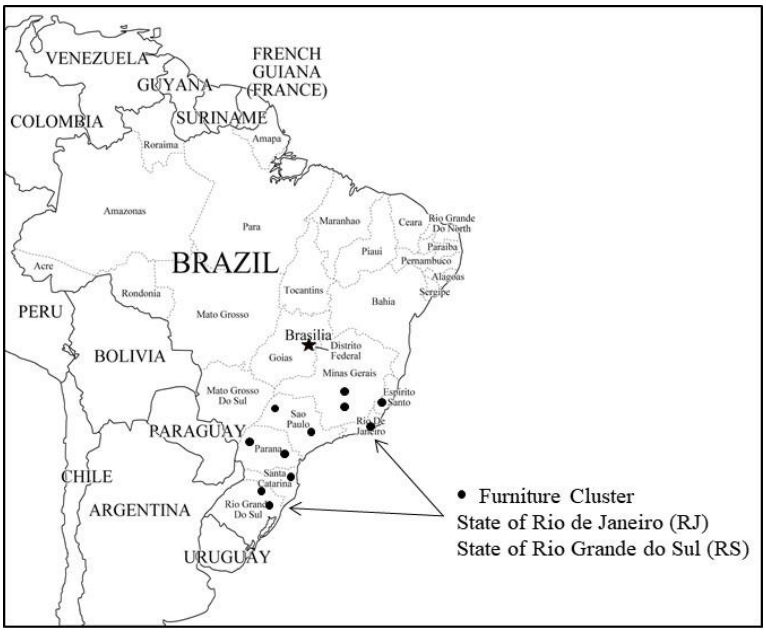


Figure 1: The map Furniture Cluster of Brazil

Source: Authors (2022).

2. Research hypothesis

Product innovation and strategic resources are capable of providing great potential for economic transformation, so they have been the subject of academic studies and taken into account by entrepreneurs, as these can influence changes in the economic position of companies. These researches are expressed in various scientific papers, published in books and journals (Schumpeter, 1934; Barney, 1991a; 1991b; 1996; Brumagim, 1994; Barney; Hesterly, 1996; Mcgrath et al., 1996; Teece et al., 1997; Eisenhardt & Martin, 2000; Besanko et. al., 2007; De Guimarães et al., 2021). It is acknowledged that there is a relationship between product innovation and the use of strategic resources, however, there are as yet insufficient empirical studies to determine which resources influence product innovation or broad studies that show the intensity of the influence relationships of these factors in the context of the Brazilian furniture industry (Guimarães, 2013: De Guimarães et al., 2016). Another important aspect is to evaluate the influence of Environmental, Social and Governance (ESG) sustainability precepts in the development of new products, as well as to verify whether ESG generates improvements in the production process, making products more competitive in the market (De Guimarães et al., 2021).

Industries and markets face rapid and unpredictable changes, requiring organizations to meet customer demands and develop innovative products quickly. Thus, there is growing recognition in resource-based research that the mere possession of a set of specific capabilities and capabilities is not enough for a firm to sustain a competitive advantage in such an environment. For Teece et al. (1997) and Eisenhardt and Martin, (2000) the company must continuously develop new capabilities and capabilities to cope with the new demands and even create a market change.

This research was based on the specialized literature fundaments, which state that the strategic resources can be a predecessor of product innovation (OCDE, 2005; Paladino, 2007; De Guimarães et al., 2016). In this sense, literature revealed that some strategic resources could directly influence product innovation. The strategic resources investigated in this research are: i) Information System (Zhang, 2011); ii) Human Resources (Kandemir et al., 2006); iii) Knowledge Management (Structure and Culture) (Prieto et al., 2009); iv) Alliance (Lambe et al., 2002).

The hypotheses and the questionnaire (Table 1) are based on the theoretical framework, developed from innovation studies and the use of strategical resources in the generation of sustainable competitive advantage, in which the individual resources and their combinations may result in competitive differentials which enhance the operational performance. In this sense, it is essential to understand the influence of strategical resources over innovation.

We highlight that the strategical resource of Information System (IS) is related to information technology, composed of hardware and software, and which serves as a support method for product innovation and enterprise performance. The IS helps with communication, teamwork and design activities and product development. Among the IS studies, we can highlight Bharadwaj (2000), Earl (2001), Nambisan (2003), Ravichandran and Lertwongsatien (2005), Kim and Lee (2006), Pavlou and El Sawy (2006) and Guimarães (2013).

People are the primary source of innovation and generation of competitive differentials. In this sense, we understand that Human Resource (HR) is composed of the dynamics and relationships that occur in the team that dedicated to the New Product/Service Development project, and that creates a shared interpretation through individual interaction and integration. In this research, HR approaches the product innovation teamwork and autonomy, which was elaborated based on studies by Huselid (1995), Wright et al. (1998), Khandekar and Sharma (2005), Kandemir et al. (2006), Armstrong, 2009; Beauvallet and Houy (2010) and Patanakul et al. (2012).

In this research, we recognize that the Knowledge Management Structure resource (KMS) comes from the premise that knowledge is a continuous result on interaction with people. So, it needs formal structure and information technology. The KMS is related to the enterprise management work for encouraging creativity and knowledge exchange among the team members, as well as the formal procedures which allow the interaction among people and collaborative work. These premises are based mainly on studies by Nonaka (1991) Narver and Slater (1995), Rieman (1996), Earl (2001), Garavelli et al. (2004), Prieto et al. (2009), Zack et al. (2009), Liu et al. (2010), Donate and Guadamillas (2011), Zhang (2011) Nezam et al. (2013) and De Guimarães et al. (2016). According to the KMS concept, this study considers that the Knowledge Management Culture (KMC) construct encompasses the relationships among the product development team members about trust and mutual respect aspects, for the generation of a culture that allows the development of new knowledge, based on the premises approached by different studies, among which we highlight: March (1991), Nonaka (1991; 1994), Zollo and Winter (2002), Subramaniam and Youndt (2005), Yang (2007), Chen and Huang (2009), Prieto et al. (2009), Donate and Guadamillas (2011) and De Guimarães et al. (2016).

Among the strategical resources, Alliance (AL) refers to the collaboration among two or more enterprises to mutually meet their desired goals, which they would not achieve separately. The alliance members can be called partners, who contribute to the growth by sharing resources and knowledge. Consistently, these premises were developed based on studies by Heide and John (1990), Varadarajan and Cunningham (1995), Sividas and Dwyer (2000), Lambe et al. (2002), Oxley and Sampson (2004) Kale and Singh (2007), Inkpen and Pien (2006) and Nieto and Santamaría (2007).

We highlight that this research contains assumptions that some strategical resources can positively influence innovation. So, specifically in this study, Product Innovation (PI) (goods or services) is defined as the market introduction of a new product or meaningfully improved, when it comes to functionality, technology, and differentiation concerning their competitors' products. The observable variables were elaborated based on studies by Gatignon and Xuereb (1997), OCDE (2005), Paladino (2007), De Guimarães et al. (2016) and Severo et al. (2017). Also in this study, it is considered that PI can

positively influence organizational performance, which achieved through New Product Development Success (NPDS). The NPDS construct refers to the capacity of a new product to be successful in the market, as well as generating revenues and profitability that are higher than their competitors'. Thus, the researches that justify the NPDS concepts are by Kohli and Jaworski (1990; 1993), Conant et al. (1993), Slater and Narver (1994), Paladino (2007) and Guimarães (2013).

2.1 Information system and product innovation

Among the resources used by the organizations, Information System (IS) is the one responsible for protecting and handling information, which stands out as a way to add data value and enable solutions in the processes of generating and developing new products (Nambisan, 2003; Pavlou and El Sawy, 2006). We should point out that, through simultaneous engineering projects which use software (CAD, CAM, CAE), the interaction in the developing team improved, making the process swifter and avoiding waste of time (Sanchez, 1995; Pavlou and El Sawy, 2006).

The IS presents solutions which enable the project management processes, as in the innovation management and new product development, which have been the topic of several researchers (Davenport, 1993; Nambisan, 2003; Pavlou & El Sawy, 2006; Alonso et al., 2010). At first, it is up to the organization to blend IS with other organizational resources, making it a complex set of complementary resources, which are not easily found by competitors, thus sustaining its advantage (Bharadwaj, 2000; Zhang, 2011).

In this sense, the new products development (NPD) performance is affected by the project conception and the technological environment, that is, the IS directly influences the NPD process (Cardinal, 2011) in the organized structure and the product project planning (De Guimarães et al., 2017), and provides a decrease in complexity, boosting the development of dynamic capacities (Guimarães, 2013). However, the IS accelerates the research processes to enable the incremental and radical innovations, through the interaction with new technologies and people (Pil & Cohen, 2006, Orlikowski, 2000), as a mean of support for product innovation and the enterprise (Zhang, 2011).

The IS is a strategic resource that can positively influence the enterprises' competitive performance and contribute to a competitive advantage when used as an essential support to product innovation (Teece et al., 1997; Bharadwaj, 2000; Tippins & Sohi, 2003; Ravichandra & Lertwongsatien, 2005; Zhang, 2007; Zhang, 2011). Within this context, the hypothesis H1 developed.

***H1**: Information System resource positively influences Product Innovation.*

2.2 Human resources and product innovation

As to human resources, we noticed they are about an intangible, strategic and fundamental resource which is able to differentiate the organization in relation to its competitors, which present the characteristics of sustainable resources (rare, non-imitable, valuable and strategically irreplaceable), with potential to foster perceived value for the customers (Ulrich et al., 1991; Wright et al., 1998; Khandekar & Sharma, 2005; Armstrong, 2009; Beauvallet & Houy, 2010). Human resources can generate a competitive advantage from human competencies and abilities, unleashing the appearance of unique capacities.

From the assumption that people are strategic resources, the organizations must manage them in order to obtain the highest optimization and, within this perspective, researches have shown that the human resources' policies, applied through personal procedures, as well as a team leadership with participative characteristics and independence to make decisions, are fundamental elements in the efficiency of this resource's usage, which can be observed in the positive relationship with productivity, quality and profitability (Schneider & Bowen, 1985; Ulrich et al., 1991; Armstrong, 2009).

Another critical factor in human resources management, which is related to product innovation, refers to the growth in project efficiency about New Product Development (NPD) in environments that encourage open management and teamwork (Huselid, 1995; Godard & Delaney, 2000; Gupta & Thomas, 2001, De Guimarães et al., 2017), for the teams which are dedicated to NPD build a shared synergy and interpretation of new knowledge which widens results (Kandemir et al, 2006; Armstrong, 2009). Another aspect to be considered is the fact that people with an exceptionally high number of social bonds contribute significantly to the dissemination and adoption of product innovation (Goldenberg et al., 2009).

For human resources, one must consider the role of the NPD Project Manager who, as a leader, works towards trying to enable the release of resources used by the teams and to contribute to effective communication among staff members. For such, the project manager must have function autonomy to break barriers between departments (Cooper, 1994; Song et al., 1997; Gupta & Thomas, 2001; Kandemir et al., 2006). Considering that human resources directly influence product innovation, the hypothesis H2 developed.

***H2**: Human Resources positively influence Product Innovation.*

2.3 Knowledge management (structure and culture) and product innovation

In the improvement of organization results through product innovation, Knowledge Management (KM) can influence the growth of organizational performance and the development of the NPD processes. The KM significance widened with the

globalization processes and technological innovations. Therefore, this resource considered strategic, since it can have influence over organization performance as well as foster the generation of new knowledge it associated with other resources, thus widening the capacities or routines in order to become precious, rare and hard-to-imitate products (Decarolis & Deeds, 1999; Kogut & Zander, 1992; Grant, 1996; Spender & Grant, 1996; Mehta, 2008; Zack et al. 2009; Donate & Guadamillas, 2011). Another aspect to consider is that the knowledge innovation is a critical element in product value creation and economic growth in a knowledge-based economy (Nezam et al., 2013)

Learning begets knowledge through people interaction (Prieto et al., 2009). So, this is a dynamic and self-generator resource of new capacities. In this view, KM presents a fundamental function in order to reach the organizational objectives, optimizing the use of resources and capabilities and fostering the generation of new, unique knowledge (March, 1991; Nonaka, 1991; Rieman, 1996; Hohl et al., 1996; Zollo & Winter, 2002; Liu et al., 2010).

For an efficient KM, the organization must offer infrastructure and information technologies which store and enable knowledge dissemination, considering the hierarchic communication structure (leadership) and organizational culture, which will influence knowledge generation and dissemination (Narver & Slater, 1995; Gold et al., 2001; Leidner et al., 2006; Kim & Lee, 2006). In environments of organizational culture directed to innovation, the knowledge integration and the opening of new team members' ideas are simplified, which contributes to the generation of innovative knowledge (Donate & Guadamillas, 2011). In this context, the innovation takes place as a natural process of knowledge generation (Guimarães, 2013).

The presence of organizational culture may facilitate the KM implementation, allowing for knowledge integration between the different internal and/or external agents of innovation. We should highlight that KM is a resource which has vast innovation influence (Narver and Slater, 1995; Earl, 2001; Garavelli et al., 2004; Prieto et al., 2009; Donate & Guadamillas, 2011).

Besides the organization's cultural aspects, leadership is a fundamental KM pillar which serves as a facilitator of processes, knowledge generation and dissemination, which are potentially innovative resources (Narver & Slater, 1995; Gupta & Thomas, 2001; Yang, 2007; Zack et al., 2009). From the assumption that the organization culture and leadership contribute to the KM resource capacity efficiency in widening the operational efficiency, generating competitive advantage to the enterprise (Nonaka, 1994; Zack et al., 2009) and molding the KM and innovation relationship (Nonaka, 1994; Subramaniam and Youndt, 2005; Chen & Huang, 2009), the hypothesis H3 developed.

H3: Knowledge Management resource (Structure and Culture) positively influences Product Innovation.

2.4 Alliance and product innovation

In search of a sustainable competitive advantage based on RBV, the alliance resource between enterprises emerges as a way these organizations have to reach common goals, bringing together different capacities, since they alone would face difficulties to reach them (Heide & John, 1990; Hunt & Morgan 1995; Varadarajan & Cunningham, 1995; Sividas & Dwyer 2000; Lambe et al., 2002; Oxley & Sampson, 2004; Kale & Singh, 2007).

The innovation capacity can be obtained through strategic alliances between enterprises because, through partnerships and networks, the organizations develop unique capabilities, which would not be possible separately (Gemünden et al., 1996; Hafeez et al., 2002; Inkpen & Pien, 2006; Nieto & Santamaría, 2007; Kale & Singh, 2007). The Alliance is a resource which enables tangible and intangible resource sharing since they are made available to the partners, from which innovation can be generated (Hunt and Morgan, 1995; Lorenzoni & Lipparini, 1999; Ritter & Gemünden, 2003; Inkpen & Pien, 2006).

Besides, strategic alliances widen the capacity of knowledge accumulation (Kale & Singh, 2007) and can become an effective propagation way of new technologies and development of new products based on innovative technologies, by the association of abilities and resources of the alliance partners. In this sense, even the vertical relationships among suppliers and buyers can stimulate innovation (Harabi, 1998; Elmuti & Kathawala, 2001; Lambe et al., 2002; Poulymenakou & Prasopoulou, 2004).

We emphasize that the strategic alliances create a net of knowledge, and there is a crescent volume of empirical researches showing that the social relationships and the networks are influencing factors that explain the knowledge creation, promotion, absorption, and use processes for the innovation generation (Phelps et al., 2012).

Another motivating aspect of partnership development is the fact that new products offer an increase in sales, profit and competitive advantage for most organizations (Guimarães, 2013). In this sense, the organizations develop business alliances, aiming at speeding up the rhythm and reducing the costs associated with the innovation (Sivadas & Dwyer, 2000). Facing the innovative context, which can be generated by the Alliance resource, the hypothesis H4 developed.

H4: Alliance resource positively influences Product Innovation.

2.5 Product innovation and new product development success

From Porter (1991) premises, the competitive advantage is seen as a privileged position as to the enterprise relationship when compared to others in the same sector. With the Barney (1991a; 1991b) and Hoffman (2000) RBV conceptual increase, the competitive advantage can be explained through the unique characteristics of services and/or products which lead and keep an enterprise to a specific position, making it different from competitors. These premises aligned with studies by Hamel and Prahalad (1990), Blyler and Coff (2003), which imply the organization must seek ways to foresee market moves and be prepared, as well as adjusted, to the new demands through a combination of resources. One of the ways to actualize the combination of resources is innovation, that is able to differentiate two concurrences. Within this perspective, the enterprises use their resources for product innovation.

Product innovation happens in processes which use capacities generated by the enterprise's resources. In this aspect, the role of Research and Development Methodology is of fundamental importance, and it evaluates the market costs, socio-environmental responsibility and demand, in order to promote new product development success and the competitive advantage conception (Baker & Sinkula, 1999; Han et al., 1998), therefore widening the value perception the client has about the new product (Brandenburger & Stuart, 1996). considering that aspects of the application of Environmental, Social and Governance (ESG) knowledge increase the possibility of success of a new product (De Guimarães, et al., 2021). Together, all these factors characterize the new product development success.

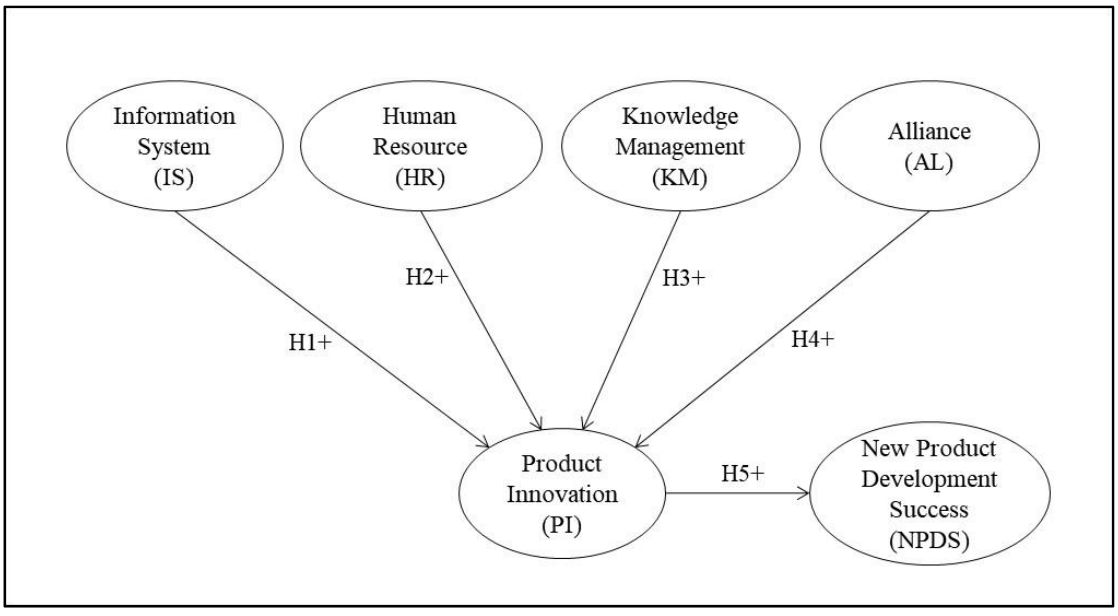
The success of this new product is related to its innovation, both in the process and in its uniqueness. In this sense, Hung et al. (2012) add that a way to develop competitive advantage is in the decision to innovate since the enterprise is the first one to hit the market. Kleinschmidt and Cooper (1991) warn that it is not possible to guarantee market performance only because of the fact the product is innovative.

Considering the aspects in the new product as the capacity to develop new functions, technological innovation, respects the precepts of Environmental, Social and Governance (ESG) and its inner knowledge (Kohli & Jaworski, 1990; Kohli et al., 1993; Paladino, 2007; De Guimarães, et al., 2021), it can be deduced that these elements generate their success (Paladino, 2007) and, consequently, a competitive advantage. Based on the premise that a product innovation improving an organization competitive position through the new product development success, the hypothesis H5 developed.

H5: Product Innovation positively influences the new product development success as an expression of competitive advantage.

Based on these assumptions, Figure 2 presents a theoretical model composing the five research hypotheses.

Figure 2: Hypothesis theoretical model

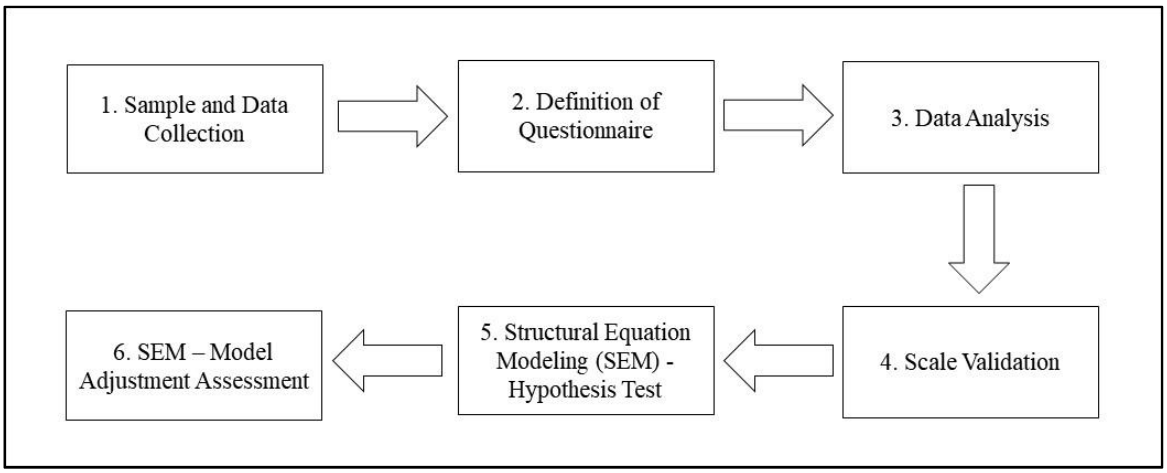


Source: Authors (2022).

3. Method

This research is classified as a quantitative survey of a descriptive character, which allowed the measurement of opinions in a given population from a statistically representative sample, which explains the researched phenomenon (Hayati et al., 2006; Hair Jr. et al., 2014). For the operationalization of the research, we follow the steps described in Figure 3.

Figure 3: Search method flow



Source: Authors (2022).

The research steps, represented in Figure 3, are described below:

a) Sample and Data Collection: To determine the sample size we followed the rule professed in the Structural Equation Modeling to use 10 respondents at least for each observable variable (Hair Jr. et al., 2014). For this research, we used 29 respondents for each statement in the questionnaire, which contributed to a Maximum Likelihood Estimation. The initial sample (before cleaning of the data) was 1108, which resulted in the final sample with 1067 valid cases, above the minimum, recommended of 200 respondents (Kline, 2005), composed of enterprises located in the states of Rio Grande do Sul (RS) and Rio de Janeiro (RJ), Brazil. In the process of choosing the enterprises which received the questionnaires, we used those who are listed on the Industrial Records in the States of RS and RJ (Fiergs, 2018; Firjan, 2018). At first, a pretest is done with 50 respondents to validate the observable variables. The collecting period ranged from December 2019 to April 2021, with 3430 e-mails sent and which gave access to the website with the research form, from which we obtained 945 questionnaires. To increase the number of respondents, 163 were collected by phone and personal contact.

b) Definition of Questionnaire: For data collection, we developed a questionnaire composed of seven blocks (Table 1), aiming at measuring the following latent variables: i) Information System (Zhang, 2011); ii) Human Resources (Kandemir et al., 2006); iii) Knowledge Management Structure (Prieto et al., 2009); iv) Knowledge Management Culture (Prieto et al., 2009); iv) Alliance (Lambe et al., 2002); vi) Product Innovation (Paladino, 2007; De Guimarães et al., 2016); vii) New Product Development Success (Paladino; 2007; Guimarães, 2013). The observable variables (Table 1) enabled the respondent to choose the level of agreement or disagreement, on a Likert scale of 5 points (1 = Strongly Disagree; 2 = Somewhat disagree; 3 = Neither disagree nor agree; 4 = Somewhat agree; 5 = Strongly agree). At the beginning of the questionnaire, the respondents informed some complimentary data which helped with sample characterization.

c) Data Analysis: The data analysis occurred through Structural Equation Modeling (SEM), which uses a series of statistical methodological procedures that enable the dependency relationship exam simultaneously between different latent variables (constructs) (Hoyle, 1995; Hair Jr. et al., 2014; Maruyama, 1998; Kline, 2005; Fabrigar et al., 2010; De Guimarães et al., 2021). For data analysis we used the SPSS® (Statistical Package for Social Sciences) software, (v.21) and to enable the SEM application, we used the AMOS® software (v.21), connected to SPSS®, which presents the necessary functionalities for analysis and modeling the method demands (Byrne, 2010).

d) Scale Validation: In order to confirm the proposed model (Figure 2), we used the Exploratory Factor Analysis (EFA) and the Confirmatory Factor Analysis (CFA), aiming at verifying the combination of observable and latent variables (constructs) through Cronbach's Alpha (Hair Jr. et al., 2014) and kurtosis index, which is evaluated by the Mardia coefficient (Mardia, 1970; 1971; Bentler, 1990). Still, for the EFA, we examined the factorial loads that represent the correlations between the measured indicators and the latent variable, in which the accepted value is over 0.5. Other tests, applied over the data for EFA: Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO), which give them EFA viability.

e) Structural Equation Modeling (SEM) - Hypothesis Test: The integrated model was evaluated through the Standardized Estimates (SE) hypotheses test, which measure the relationships and correlations in the constructs. The use of the SE test enables the evaluation of the measuring model adequacy, which predicts the co-variances or correlations matrix. For such, we used the recommendations by Iriondo et al. (2003), Kline (2005), Hair Jr. et al. (2014), Severo et al. (2018) and De Guimarães et al. (2021).

f) SEM - Model Adjustment Assessment: Based on empirical studies, we noticed that the models initially specified may be rejected by excellence and adequacy tests. Thus, some adjustments and modifications on the model are bound to happen (Hair Jr. et al., 2014; Iriondo et al., 2003), as is the case for this research, that the final integrated model went through some changes in relation to the initial model. At first, we analyzed the measures of absolute adjustment of the integrated model aiming at evaluating the level on which the measuring model foretells the covariance or correlation matrix.

From these, we used: i) Chi-square divided by Degrees of Freedom (χ2/DF) (equal to or lower than 5.0); ii) Goodness of Fit Index (GFI) (>0.90); iii) Root Mean Squared Error of Approximation (RMSEA) (between 0.05 and 0.08); iv) Adjusted Goodness of Fit Index (AGFI) (>0.90); v) Normed Fit index (NFI) (>0.90); vi) Goodness of Fit Index (GFI) (>0.90); and vii) comparative indexes of Root Mean Square Residual (RMR) and Expected Cross-Validation Index (ECVI), which we expect that the lower the value, the better the model adequacy will be.

4. Results

For data cleansing we excluded questionnaires evaluated as outliers, eliminating data which presented distortions in relation to other data (Hair Jr. et al., 2014), as is the case of those which presented answers concentrated on a single alternative, which resulted in the elimination of 41 forms. The data collection on the electronic form didn't allow the registration of forms which had any unanswered question. Thus, no collected data were found missing.

Still, on database preparation, we performed the analysis of univariate and multivariate outliers to verify if there were any extreme scores in more than one variable or if the score configuration was unusual. To determine these outliers, we calculated the Z scores and, as recommended by Hair Jr. et al. (2014), we tried to identify the cases with values higher than |3.3| for each variable.

For the multivariate outliers identification, we used the Mahalanobis calculation, which showed no cases with significant distance between the individual and the average sample value (Kline, 2005), but which didn't justify the elimination of cases for such reason, allowing a final sample of 1067 valid questionnaires.

In the collected data, 42.4% of the enterprises have been in the market for up to 20 years of existence, and only 13.1% have been for more than 50 years. We noticed 96.6% of Brazilian capital; 1.8% of Multinationals; and 1.6% of mixed capital. Among these, 90.9% are Micro and Small businesses, 6.4% are Medium, and 2.7% are Large businesses.

In the research, we saw that in 75.4% of the enterprises, only internal agents of innovation work; 3.1% are exclusively external agents; 21.5% are both internal and external agents. Thus, we see that only 23.6% of the enterprises use processes of open innovation (Chesbrough, 2003; Huizingh, 2011). However, we didn't identify any radical innovation (disruptive) in the research (O´Connor et al., 2002) as it only deals with increment product innovation, according to classification by Garcia and Calantone (2002).

4.1 Factorial analysis between blocks

After data depuration, we started the methodological process to confirm the theoretical model (Figure 2). The EFA model presents 6 factors which explain 69.66% of data variability, whereas for the 7 factors there is 76.24% of variability explanation. The initial theoretical model foresaw the existence of only 6 factors.

Through Varimax rotation, EFA showed the factor composition in 7 combinations of observable variables, suggesting that the Knowledge Management construct divided into two latent variables. However, for the analysis of the initial integrated model, we used 6 constructs, according to the model of theoretical construction.

The Cronbach's Alpha calculated value for all the factors is 0.939, which exceeds the recommended value of 0.7 (Hair et al., 2007; Lee & Hooley, 2005). The Bartlett's Test of Sphericity presented a statistically meaningful result, as well as KMO resulted in 0.878, granting workability to EFA (Hair Jr. et al., 2014).

The Kurtosis index presented values lower than 5 in the Mardia Coefficient calculation (Mardia, 1970; 1971; Bentler, 1990), which allows considering data normality. Additionally, we analyzed the asymmetry of the observed variable data that presented Pearson coefficient with values close to zero, which indicates a moderate symmetry proved by studies from Kline (2005) and Hair Jr. et al. (2014).

Table 1 expresses the constructs and the observable variables. We should highlight there is a respondent agreement about the existence and the use of strategic resources in the enterprises, which can be evidenced by the answer average being above 3.38 and the standard deviation below 1.0. The data reliability presents Alpha Cronbach's values of each construct above 0.7, which is acceptable for data analysis (Hair Jr. et al. 2014).

Table 1: Factor loadings of the observable variables

Observable variables	Factorial Loads [a]	Communality
Construct Information System (IS)		
IS1) Our Information System supports cost reduction when adopting new products for market segments where the enterprise acts.	0.871	0.833
IS2) Our Information System supports cost reduction when modifying or adding characteristics to a new product.	0.772	0.726
IS3) Our Information System supports cost reduction when projecting new products.	0.893	0.852

IS4) Our Information System provides unique opportunities for Product Innovation.	0.755	0.664
IS5) Our Information System gathers more information about the new products.	0.882	0.857
IS6) Our Information System supports the creation of a new set of information on existing products in order to increase their value.	0.803	0.792
Mean 3.86; Standard Deviation 0.834; Cronbach's Alpha 0.937		
Construct Human Resource (HR)		
HR1) The enterprise's high management is involved and committed to Product Innovation.	0.793	0.800
HR2) There is a project manager with autonomy on New Product Development for the development of new products.	0.753	0.738
HR3) The enterprise uses a multidisciplinary team for New Product Development.	0.852	0.813
HR4) The enterprise makes a focused and dedicated team available for the development of a new product.	0.818	0.836
Mean 4.12; Standard Deviation 0.885; Cronbach's Alpha 0.913		
Construct Knowledge Management Structure (KMS)		
KMS5) The managers are open to individual proposals and creativity from members of the New Product Development team.	0.765	0.776
KMS6) The formal procedures and systems which affect the New Product Development encourage people to search for knowledge, despite the organizational structure.	0.806	0.683
KMS7) The formal procedures and systems which affect the New Product Development are projected to help knowledge exchange through department borders.	0.858	0.774
KMS8) Formal procedures and systems which affect New Product Development are destined to promoting collective work instead of an individualist behavior.	0.864	0.790
KMS9) The managers propitiate an atmosphere of trust and cooperation.	0.808	0.747
KMS10) The formal procedures and systems which affect New Product Development are generally flexible and adaptable.	0.798	0.705
Mean 3.92; Standard Deviation 0.848; Cronbach's Alpha 0.925		
Construct Knowledge Management Culture (KMC)		
KMC1) The New Product Development team members have relationships based on faith and mutual trust.	0.662	0.722
KMC2) The New Product Development team members are generally reliable.	0.769	0.821
KMC3) The New Product Development team members are respectable and comprehensible in relation to their colleagues in the team.	0.711	0.831
KMC4) The New Product Development team members are sincere when expressing their opinions about their colleagues' work.	0.742	0.831
Mean 4.04; Standard Deviation 0.850; Cronbach's Alpha 0.908		
Construct Alliance (AL)		
AL1) With our partners we create capacities which are unique for this alliance.	0.702	0.707
AL2) Along with our partners we develop a series of knowledge which is adapted to our relationship.	0.799	0.788
AL3) Along with our partners we have invested a lot in the building of our business together.	0.837	0.840
AL4) If this relationship with our partners ended, we would be missing a whole lot of knowledge which is adapted to our relationship.	0.816	0.711
AL5) We and our partners contribute to different resources so that the relationship helps us reach mutual objectives.	0.852	0.789
AL6) We and our partners have complementary strengths which are useful to our relationship.	0.841	0.777
AL7) Each one of us has distinct abilities that, when combined, enable us to reach objectives beyond our individual reach.	0.802	0.680
AL8) We and our partners are always looking for enterprises who could be partners in the collective development of competitive advantage.	0.740	0.656
Mean 3.99; Standard Deviation 0.705; Cronbach's Alpha 0.942		
Construct Product Innovation (PI)		
PI1) Environmental, Social and Governance (ESG) knowledge in the development of new products generates improvements in the production process and more competitive products on the market.	0.611	0.576
PI2) In terms of functionality, our product and resources are higher when compared to our competitors'.	0.526	0,545
PI3) In general, we have an advantage over our competitors in terms of superior products offered to our clients.	0.862	0.860

PI4) Our new products present minor improvements in the current technology.	0.852	0.800
PI5) Our new products incorporate a major body of new technological knowledge.	0.828	0.815
PI6) The applicability of our new products is totally different from our main competitors'.	0,801	0.681
Mean 4.05; Standard Deviation 0.705; Cronbach's Alpha 0.906		
Construct New Product Development Success (NPDS)		
NPDS1) Our new products' success rate is much better in relation to our competitors'.	0.705	0.605
NPDS2) Our revenue and profitability with new products is much higher in relation to our competitors'.	0.914	0.893
NPDS3) Production of our new products respects the precepts of Environmental, Social and Governance (ESG).	0.906	0.892
Mean 3.38; Standard Deviation 0.852; Cronbach's Alpha 0.860		

[a] Extraction method: Main component analysis – rotation Varimax with Kaiser normalization.
Source: Authors (2022).

In the process of scale depuration, we noticed the Communality which refers to the total variance amount that an original variable share with all other variables in the research, and, according to Hair Jr. et al. (2014), we must cross out values below 0.5. We didn't identify any low communality in this study.

Concerning the Average Variance Extracted (AVE) analysis (Table 2), which explains the total variance in each observable variable and which is used to evaluate each construct (Fornell & Larcher, 1982). For Severo et al. (2018) the CV and DV indexes are part of the AVE and therefore should be highlighted in the data analysis. The AVE measures the Convergent Validity (CV), which presented values above the recommended >0.7 (Hair Jr. et al., 2014), and shared variance evaluated by the Discriminant Validity (DV), which presented lower CV values.

To validate the observable variables, we performed a reliability test, which comprehends the total amount of true score variance concerning the overall score variance. For this test, every variable analyzed jointly presented a Composite Reliability of 0.992, which is above the recommended 0.7 (Marôco, 2010). From these indexes, we assume the observable variables are consistent in their measurements.

The Pearson correlation analysis indicated seven correlations above 0.8 (IS1<-->IS3 [0.873]; IS1<-->IS5 [0.904]; IS2<-->IS6 [0.873]; IS3<-->IS5 [0.864]; HR2<-->HR4 [0.825]; KMC3<-->KMC4 [0.810]; NPDS2<-->NPDS3 [0.911]), which can typifies multicollinearity and shows redundancy between two variables (Kline, 2005; Hair Jr. et al., 2014). However, we kept the observable variables, considering they are fundamental questions for the understanding of the constructs researched. The intrablocks for the constructs presented values which favored the scale validation, since the communality was considered satisfactory.

Table 2: Convergent Validity and Discriminant Validity

Constructs	KMS	KMC	IS	HR	AL	PI	NPDS
Knowledge Management Structure (KMS)	0.799[a]						
Knowledge Management Culture (KMC)	0.755[b]	0.834[a]					
Information System (IS)	0.165[b]	0.164[b]	0.830[a]				
Human Resource (HR)	0.208[b]	0.178[b]	0.444[b]	0.850[a]			
Alliance (AL)	0.189[b]	0.200[b]	0.298[b]	0.472[b]	0.796[a]		
Product Innovation (PI)	0.288[b]	0.231[b]	0.300[b]	0.429[b]	0.490[b]	0.766[a]	
New Product Development Success (NPDS)	0.138[b]	0.103[b]	0.315[b]	0.171[b]	0.284[b]	0.295[b]	0.823[a]

[a] Average Variance Extracted – Convergent Validity
[b] Correlation between the constructs – Discriminant Validity
Source: Authors (2022).

Another aspect analyzed was the search for moderating variables, which could interfere in data analysis, compromising their study results like the possibility of respondents' divergent behavior: i) different enterprises' sizes (group of micro and small enterprises and group of medium and large enterprises); ii) social capital origin (national, multinational and mixed capitals); iii) enterprises from the states of Rio Grande do Sul and Rio de Janeiro. Through ANOVA's calculation, we noticed they are meaningful differences between the enterprise's size group, social capital origin and the states in Brazil.

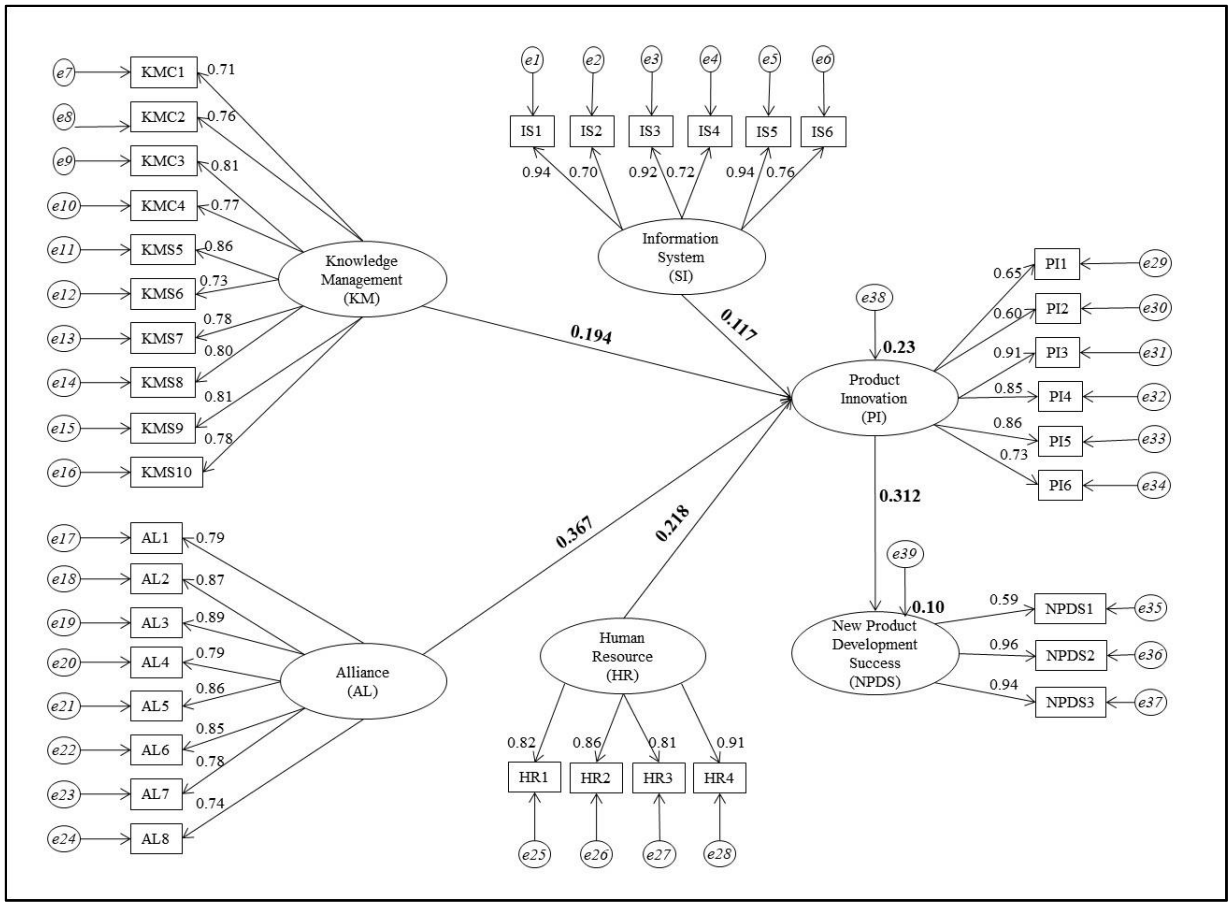
4.2 Initial integrated model analysis

After the scale and construct validation which make up the theoretical model, we performed an initial integrated model analysis (Figure 4) to measure the relationships between the Alliance, Knowledge Management (Structure and Culture), Information System, Human Resource, Product Innovation and New Product Development Success constructs, as well as the variables proposed in the theoretical model. In this initial integrated model, the Knowledge Management construct has all the observable variables, both for culture and structure.

In this evaluation process, we considered the model adjustment and the statistical significance of the approximate coefficient indexes, as suggested by Kline (2005) and Hair Jr. et al. (2014). Table 3 expresses the relationship results between

the initial integrated model Critical Ratio (CR) constructs, in which we consider values above 1.96 and below -1.96 that are meaningful for the two-sided test (Rigdon, 1999). The standard deviation for these relationships considered very low, which contributes to the integrated model validation.

Figure 4: Initial integrated model



Source: Authors (2022).

Based on the theoretical model study and on the indexes suggested by Hair Jr. et al. (2014) to analyze the absolute adjustment measurements, we reached the initial result for the hypotheses raised in this research (Figure 4). In the hypotheses test demonstrated in Table 3, we see that hypothesis H1 presents a weak relationship (SE=0.117). However, this hypothesis confirmed in the initial integrated model. The H2 hypothesis test results (SE=0.218), H3 (SE=0.194), H4 (SE=0.367), and H5 (SE=0.312) confirm the hypotheses.

Table 3: Hypothesis test initial integrated model

	Constructs			Standardized Estimate (SE)*
H1	Information System (IS)	-->	Product Innovation (PI)	0.117
H2	Human Resources (HR)	-->	Product Innovation (PI)	0.218
H3	Knowledge Management – Structure and Culture (KM)	-->	Product Innovation (PI)	0.194
H4	Alliance (AL)	-->	Product Innovation (PI)	0.367
H5	New Product Development Success (NPDS)	-->	New Product Development Success (NPDS)	0.312

Source: Authors (2022).

From the analysis results (Table 1 and Figure 4) in relation to the assumptions on this research, we can see the hypotheses confirmation about the positive relationship between the constructs: i) Information System and Product Innovation (H1); ii) Human Resource and Product Innovation (H2); iii) Knowledge Management (Structure and Culture) and Product Innovation (H3); iv) Alliance and Product Innovation (H4); v) Product Innovation and New Product Development Success (H5).

Table 5 presents AMOS® output indexes for initial integrated model analysis used in the absolute adjustment measurements analysis (Hair Jr. et al., 2007). On a first analysis of the Chi-square divided by Degrees of Freedom ($\chi 2/DF$), on which we reached 13.98, we noticed it goes over the limit of 5.0 (Tanaka, 1993).

In the initial integrated model adjustment analysis, notice on Table 5 that the indexes show model inadequacy. RMSEA (0.114) presents a value higher than the limit (between 0.05 and 0.08) defined by Kline (2005) and Hair Jr. et al. (2014). The

GFI index calculation found a value of 0.673, with AGFI value of 0.632, as well as indexes for NFI (0.759) and CFI (0.772), where we expect a value above 0.9, comparing the theoretical model with the null model (Hair Jr. et al., 2014; Kline, 2005).

The absolute adjustment measurement analysis (GFI, AGFI, NFI, CFI, RMSEA) shows the initial integrated model weakness (Figure 4). This model is not adequate to the empirical research analysis, using Table 5 indexes as parameters, which did not reach the recommended values. Upon facing this finding, we developed a final integrated model of collected data in this research.

4.3 Final integrated model analysis

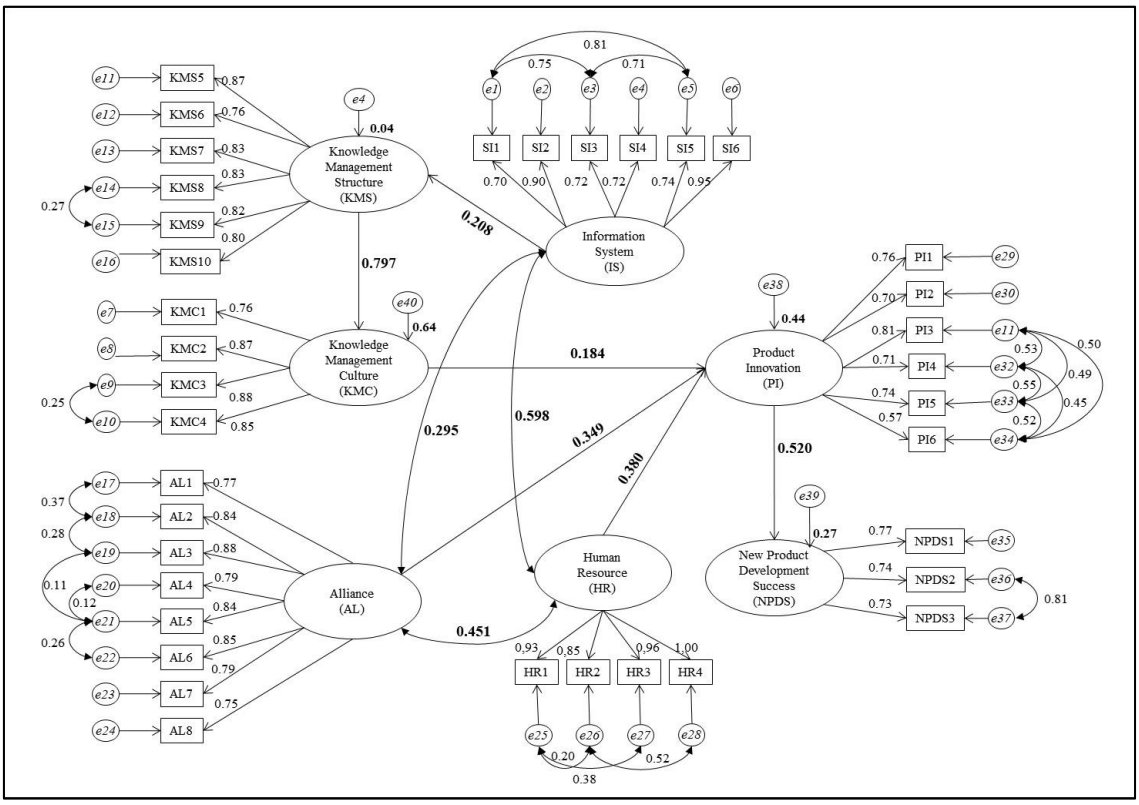
The final integrated model was based on exploratory factor analysis (EFA) study, on reliability tests and data validation. Therefore, it is about a complementary study to the hypotheses on this research, which aimed at finding an integrated model which better analyzed the empirical data. In this sense, the first modification in the model is about a division suggested by EFA in the Knowledge Management (Structure and Culture) construct. Thus, the model was performed considering 7 latent variables: i) Alliance (AL); ii) Knowledge Management Structure (KMS); iii) Information System (IS); iv) Product Innovation (PI); v) Human Resource (HR); vi) Knowledge Management Culture (KMC); and, vii) New Product Development Success (NPDS)

From the EFA results, we started a model creation experiment which could adjust the data analysis, reaching the final integrated model (Figure 5). In these model experiments, we checked on the literature that the Information System construct is directly related to KMS, for IS allows Knowledge Management (KM) a combination with other intangible resources, adding value to the organization (Powell & Dent-Micaleff, 1997; Bharadwaj, 2000; Zhang, 2011).

Next, we proceeded to the direct relationship between the KMS and KMC constructs, for, to implement KM it is of fundamental importance to have infrastructure and information technology to store and spare knowledge. Thus, we enable KM culture (Gold et al., 2001; Kim & Lee, 2006). In the final integrated model formation chain, we chose to keep the direct relationships between the Alliance and Human Resource and Product Innovation constructs, as well as this one to the New Product Development Success construct.

Another model alteration approaches the correlations between the observable variables, observed through the Pearson correlation, and which represent the correlations that most contributed to the final integrated model adjustment evaluation indexes improvement.In the SEM process, facing the new model setting, the AMOS® software suggested the existence of correlations between some latent variables (AL<-->IS; HR<-->IS; AL<-->HR), thus they were added to the model.

Figure 5: Final integrated model



Source: Authors (2022).

The final integrated model hypotheses test, with relationships and correlations between the constructs, are shown in Table 4. The Critical Ratio (CR) has meaningful results for the two-sided test (Rigdon, 1999) and the standard deviation is adequate to the data analysis.

Table 4: Hypothesis test final integrated model

Constructs			Standardized Estimate (SE)*
Information System (IS)	-->	Knowledge Management Structure (KMS)	0.208
Knowledge Management Structure (KMS)	-->	Knowledge Management Culture (KMC)	0.797
Knowledge Management Culture (KMC)	-->	Product Innovation (PI)	0.184
Alliance (AL)	-->	Product Innovation (PI)	0.349
Human Resource (HR)	-->	Product Innovation (PI)	0.380
Product Innovation (PI)	-->	New Product Development Success (NPDS)	0.520
Alliance (AL)	<-->	Human Resource (HR)	0.451
Human Resource (HR)	<-->	Information System (IS)	0.598
Alliance (AL)	<-->	Information System (IS)	0.295

*Significance level p<0.001
Source: Authors (2022).

Based on the final integrated model, we reached the AMOS® report output indexes, shown in Table 5, which highlight a meaningful improvement of the Chi-square divided by Degrees of Freedom (9.25), in comparison with the initial model (13.98). The calculation of CFI (0.861), NFI (0.847), GFI (0.775) and AGFI (0.736) resulted in next to the recommended (0.9) (Kline, 2005; Hair Jr. et al., 2014; Marôco, 2010) and are better in comparison with the initial integrated model. The RMSEA (0.09) and RMR (0.078) improved. These indexes allow us to state that the final integrated model presents an adequate adjustment for the analysis of relationships and correlations between the variables researched.

Table 5: Adjustment index of the integrated model - initial and final

Adjustment index	Integrated Model	
	Initial	Final
Chi-square (χ^2)	8.720.993	5.547.094
Degrees of Freedom (DF)	624	600
Chi-square divided by Degrees of Freedom (χ^2/DF)	13.98	9.25
Level of probability	0,000*	0,000*
CFI – Comparative Fit Index	0.772	0.861
NFI – Normed Fit index	0.772	0.847
GFI – Goodness of Fit Index	0.673	0.775
AGFI – Adjusted Goodness of Fit	0.632	0.736
RMSEA – Root Mean Squared Error of Approximation	0.114	0.091
RMR – Root Mean Square Residual	0.165	0.078
KMO – Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.878	
Average Variance Extracted	0.777	
Composed Reliability	0.992	
Cronbach's Alpha	0.939	

* Level of significance p<0,001
Source: Authors (2022).

5. Discussion

The results analysis through the initial and final models, supported by literature (Lambe et al., 2002; Ravichandra & Lertwongsatien, 2005; Inkpen & Pien, 2006; Kandemir et al, 2006; Paladino, 2007; Armstrong, 2009; Prieto et al., 2009; Zack et al. 2009; Beauvallet & Houy, 2010; Liu et al., 2010; Donate & Guadamillas, 2011; Zhang, 2011; Hung et al., 2012) showed contributions to the advancement of academic researches and managerial implications when it comes to the use of resources for innovation in search of competitive advantage before competitors.

One of this study's contributions for academic researches lies in the results obtained to evaluate the relationship between specific resources (Alliance, Information System, Human Resource, Knowledge Management Structure, and Culture) with Product Innovation, and this with New Product Development Success. In the empirical study, we noticed that Product Innovation results from the use of resources, which configures innovation antecedents and supports studies by Lambe et al. (2002), Kandemir et al. (2006), Paladino (2007) and Zhang (2011).

Studies which approach Product Innovation as an innovative process must consider which resources are being used by the enterprises, for they are pre-editors that create an innovative condition, considering that the innovation process begins before the ideas. To innovate, one needs an innovative condition within the organization, which is generated by all kinds of resources when allowing the interaction between people and teams, knowledge change and exchange, communication and storage of learning, as well as allowing the association and interaction with other organizations.

In this study we noticed that innovativeness is the capacity to generate innovation in an environment of resources available, as is the case of Knowledge Management (Structure and Culture) which widens the organizational capabilities of acquiring, disseminating and generating new knowledge, which is reinforced by the researches from Prieto et al. (2009). We emphasize that the results (Table 4) of the relation between KMS--->KMC (SE=0.797) prove the high organizational structure influence on the development of an innovating culture, which is in accordance with researches by Prieto et al. (2009) and De Guimarães et al. (2016), and which have stated that knowledge is the result of a continuous interaction between people in and out of the organization, since knowledge must be generated by an infrastructure which has a set of information technology in order to guarantee the decisive processes, individual participation and knowledge dissemination in all the organizational levels.

The major KMS-->KMC influence is a research finding which contributes to stimulating enterprises' managers to create organizational structures that can use human and knowledge resources for the development of an innovative culture capable of generating a sustainable competitive advantage.

On the other hand, Human Resource contributes to innovativeness in the creative processes and, above all, in team interactions, which, in this sense, make leadership something of fundamental importance as a foundation link to human potentials, supporting findings by Kandemir et al. (2006).

Alliance is shown as a resource which, although it is not new, gets a highlight room in academic studies, foretelling it as a solution to strengthen creative and organizational energy, for the enterprises altogether engender value which, alone, they would not be able to do so, whether by the information exchange and/or by the combination of resources.

Studies by Bharadwaj (2000), Nambisan (2003), Ravichandra and Lertwongsatien (2005), Pavlou and El Sawy (2006), Mehta (2008) and Zhang (2011) support the idea that there is an essential relationship between the Information System and the Product Innovation resource. However, this empirical study demonstrates a low direct relationship between these constructs. Notwithstanding, IS showed to have a connection with all other resources studied. This research reached a fundamental observation, that IS is the conditioning trainer who leads to the internal context of communication and essential instrument in managing the organization's different resources, which can widen innovativeness capacity.

Additionally, the academic community finds in this study a framework to evaluate the Product Innovation antecedents, considering the enterprises have resources that can produce innovation and affect performance before other organizations. Still, in this study, information is available to the companies related to the use of strategic resources which contribute to the innovative capacity widening. It is mandatory that the enterprises identify the innovation antecedents and the relationships between strategic resources and Product Innovation. After these resources have been identified, they can be worked out to widen the individual capacities, managing interaction, and integration of these resources to strengthen the organization's competitiveness.

This study also evaluated the formative influence of the Environmental, Social and Governance (ESG) precepts on Product Innovation (PI) and New Product Development Success (NPDS) in achieving sustainable competitive advantage. The results of the Exploratory Factor Analysis (Factorial Loads - Table 1) indicate that this influence is significant for ESG-->PI (PI1-->PI=0.611) and ESG-->NPDS (NPDS3 -->PI=0.906). However, this is an important situation that must be studied in depth.

Among these study's limitations, we highlight the use of subjective measures, obtained through a questionnaire, which enables the occurrence of a Common Method Variance (CMV), since we used self-answered questionnaires to collect data about several variables simultaneously. The CMV effect discussed by Podsakoff et al. (2003), Sharma et al. (2009) and Chang et al., 2010. Another limitation is about the application of statements, as the use of the level scale (5-point Likert scale), which can produce biased answers that come from the mistaken generalization effect (Halo), which happens from one single characteristic, quality, object or person, as well as the influence of social desire that can increase or decrease the relationships among the constructs. The Halo effect studied by Bagozzi and Yi (1991) and Podsakoff et al. (2003).

In order to identify and avoid the CMV and the Halo effects, the research evaluated the data normality and variability through tests like Simple Reliability (Cronbach's Alph), Kaiser-Meyer-Olkin (KMO), Kurtosis, Pearson's Skewness coefficient, Bartlett's sphericity tests, Composite Reliability, Average Variance Extracted (AVE), Convergent Validity (CV) and Discriminant Validity (DV), to analyze the data variability, normality and response consistency. The results confirmed the scale and construct statistical variability shown in Table 1.

We find it necessary to highlight that the study is limited to the investigation of the furniture industry in the state of Rio Grande do Sul and in the state of Rio de Janeiro (Brazil). Therefore, the results must consider the local geographical limitations and economic status.

6. Conclusion

Based on the results, the study showed that, in the enterprises researched, the Information System, Human Resource, Knowledge Management (Structure and Culture) and Alliance resources are antecedents to Product Innovation, which was highlighted by the initial integrated model (Figure 4) and by the Standardized Estimate (SE) (Table 3), which expresses the effective direct relationship between these resources and Product Innovation, supporting the hypotheses on this research.

It is noteworthy that the main contribution of this research to the literature and the advancement of science found in the framework for analyzing the Product Innovation antecedents, which pointed out that the enterprises with strategic resources can widen the innovativeness capacity when generating Product Innovation that leads to the success of a new product. The literature made available alternatives for strategic resources which could be positively related to Product Innovation. However, this research offers the academic community an analysis model (framework) that considers the relationships and correlations between the constructs in search of a sustainable competitive advantage under the RBV, using Environmental, Social and Governance (ESG) expertise.

The framework developed in this study to evaluate resources that are antecedents to Product Innovation will be efficient in competitiveness, applied to the dynamics of the organization capacity use if they come from strategic resources. Transforming resources in routines, catalyzing them into competencies, is a manager's role. However, it is necessary to identify the resources which lead to innovation, since the innovative process and the innovation, as a result, can economically transform an organization. In this sense, the New Product Development Success showed as an essential way of competitive advantage, comparing the Product Innovation results with the competitors and relating this performance to the use of ESG precepts.

This empirical study demonstrates a low direct relationship between the Information System and the Product Innovation constructs, which points to possible theoretical gaps in this relationship and which can be investigated in future studies in the search to answer new research questions on furniture industry: i) how do the enterprises use the Information System resource?; ii) what are the differences between enterprises when it comes to Information System resource use?; iii) what are the different technologies and methods of Information System used in the enterprises?; iv) what is the role of Information System in the enterprises' interaction and integration?

Another critical factor is the use of strategic resources in innovation. Therefore, we suggest the investigation of other research questions: i) how do the furniture industry enterprises use different strategic resources in the innovative process?; ii) what are the significant differences between companies in the furniture industry in the process of developing new products? what Environmental, Social and Governance (ESG) factors influence the process of sustainable Product Innovation and the achievement of sustainable competitive advantage?

We emphasize that this empirical research identified that product innovation is the result of resource use, which configures innovation predecessors. Therefore, further studies that approach product innovation as a process must consider which resources are being used by enterprises to create an innovating environment, since innovation starts before ideas. Innovating demands, a groundbreaking status within the organization, which is generated by the resources that enable the interactions between people, the knowledge generation and dissemination, as well as allowing the association and the cooperation with other organizations.

Acknowledgements

The research was carried out with support received from the National Council for Scientific and Technological Development (CNPq), Brazil. The authors thank NENO for their support in the development of the research.

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Authors Biographies

Julio Cesar Ferro de Guimarães - Universidade Federal de Pernambuco (UFPE) /Professor
Post-Doctorate in Administration from the University of Caxias do Sul (UCS). PhD in Administration from the Pontifical Catholic University of Rio Grande do Sul (PUC/RS), and from the University of Caxias do Sul (UCS). Master's degree in Production Engineering from the Federal University of Rio Grande do Sul (UFRGS). Specialization (Post Graduation) in Environmental Management and Sustainable Development at Faculdade International de Curitiba (FACINTER). Specialization (Post Graduation) in Product Design at Faculdade da Serra Gaúcha (FSG). Bachelor's degree in Business Administration from the University of Caxias do Sul (UCS). Adjunct Professor, Administration Undergraduate Program, Centro de Ciências Sociais Aplicadas (CCSA), Universidade Federal de Pernambuco (UFPE). Coordinator of the Undergraduate Business Administration Course at UFPE (Recife-PE). Permanent Professor of the Master's Degree Programs PPHTur (UFPE) and MPAdm (UFPE). Leader of the CNPq Research Group "Innovativeness: Research Group on Innovation and Sustainable Operations".
ORCID: https://orcid.org/0000-0003-3718-6075
E-mail: julio.cfguimaraes@ufpe.br

Eliana Andréa Severo - Universidade Federal de Pernambuco (UFPE) /Professora
Pos-Doctorate in Business Administration from the University of Caxias do Sul (UCS). Doctorate in Business Administration from the Pontificia University Católica of Rio Grande do Sul (PUCRS), and University of Caxias do Sul (UCS). Master Degree in Business Administration from the University of Caxias do Sul. Environmental Management Specialist with Emphasis on Industry (UCS). Graduated in Biological Sciences from the University of Santa Cruz do Sul, (UNISC). Graduate in Administration from University Vale do Rio dos Sinos (UNISINOS). Experience in the area of Business Administration, with emphasis in environmental management, innovation, entrepreneurship, strategy and human resource management. Honorary Member of the Editorial Board of the IJBST Group of Journals. Member Editorial Board of the International Journal of Social and Educational Sciences (USBED). Editorial Board Member of International Journal of Advance Study and Research Work (IJASRW). Editorial Board Member of the Global Research and Development Journals (GRD). Member of the Editorial Board of Data Science and Decision Making in Betasciencepress Publishing. Editorial Board of Sustainable Consumption.
ORCID: https://orcid.org/0000-0002-5970-4032
E-mail: elianasevero2@hotmail.com

Eric Charles Henri Dorion - École de Technologie Supérieure ÉTS (MGPE) /Professor
Eric C.H. Dorion holds a PhD in Business Administration from the University of Sherbrooke, Canada (2003), a Master in Business Administration from Université Laval, Canada (1997) and a Bachelor in Geography from Université Laval, Canada (1985). He is currently a professor at École de Technologie Supérieure ÉTS (MGPE), Canada, and a visiting professor at UFSM (PPGOP/PPGAP). He has experience in Administration, Technology and Regional Development; working mainly on the following topics: organizational studies, innovation and sustainability management, project management, business strategy and entrepreneurship.
ORCID: https://orcid.org/0000-0002-3472-3835
E-mail: echdorion@gmail.com