Revista Dimensión Empresarial

Artículo de investigación

Entrepreneurship, Business Model, and Design Thinking in Small and Medium-Sized Brazilian Enterprises (SMEs)

Emprendimiento, Modelo de Negocio y Pensamiento de Diseño en Pequeñas y Medianas Empresas (PYMEs) Brasileñas.

Empreendedorismo, Modelo de Negócio e Design Thinking na Pequena e Média Empresa Brasileira

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Tipo de artículo: Artículo de investigación / **Recibido:** 9/06/2021 **Aceptado:** 19/08/2021
JEL Classification:

Cómo citar:
Aranha, E. A., Silva Corrêa, J. & El Mouallem, A. (2021). Entrepreneurship, Business Model, and Design Thinking in Small and Medium-Sized Brazilian Enterprises (SMEs). *Revista Dimensión Empresarial, 19*(3), 46-64 DOI: 10.15665/dem.v19i3.2799

Abstract

The research objective is to examine entrepreneurship, business model (BM), and design thinking (DT) connected in an integrated way, by aiming to foster innovation in an established small enterprise. This research is exploratory and qualitative, which is supported by a Brazilian small enterprise case study. The main findings indicate that analytical framework of entrepreneurship, BM, and DT connected in an integrated way foster innovation in small enterprise. The findings are innovative because they help to broaden understanding of entrepreneurship, BM, and DT connected in an integrated way in small enterprise to promote innovation and fill the gap in the literature. The findings have practical implications for managers and owners of established companies, human resources coordinators and managers, as well as students and professors of undergraduate and graduate programs.

Keyword: Entrepreneurship; Business Model and Design Thinking in Small and Medium-Sized Brazilian Enterprises (SMEs).

Resumen

El objetivo de la investigación es examinar el emprendimiento, modelo de negocio (MN) y design thinking (DT) conectados de manera integrada, para fomentar la innovación en pequeñas empresas establecidas. La investigación es exploratoria y cualitativa, respaldada por un estudio de caso de una pequeña empresa brasileña. Los principales resultados indican que la estructura analítica del emprendimiento, MN y DT conectados de manera integrada promueven la innovación en la empresa. Los resultados son innovadores porque ayudan a ampliar la comprensión del emprendimiento, MN y DT conectados de manera integrada en pequeña empresa para fomentar la innovación y llenar el vacío en la literatura. Los resultados

tienen varias implicaciones prácticas para los gerentes y propietarios de empresas establecidas, coordinadores y gerentes de recursos humanos y estudiantes y profesores de programas de pregrado y posgrado.

Palabras clave: Emprendimiento, Modelo de Negocio y Pensamiento de Diseño en Pequeña y Medianas Empresas (PYMEs) Brasileñas.

Resumo

O objetivo da pesquisa é examinar o empreendedorismo, BM e DT conectados de forma integrada, para fomentar a inovação em pequenas empresas estabelecidas. A pesquisa é exploratória e qualitativa, apoiada por um estudo de caso de uma pequena empresa brasileira. As principais conclusões indicam que a estrutura analítica do empreendedorismo, BM e DT conectados de forma integrada promovem a inovação na pequena empresa. Os resultados são inovadores porque ajudam a ampliar a compreensão do empreendedorismo, BM e DT conectados de forma integrada em pequenas empresas para fomentar a inovação e preencher a lacuna na literatura. Os resultados têm implicações práticas para gerentes e proprietários de empresas estabelecidas, coordenadores e gerentes de recursos humanos e alunos e profesores de cursos de graduação e pós graduação.

Palavras-chave: empreendedorismo, modelo de negócio; design thinking, pequena empresa.

Introduction

Entrepreneurship, business model (BM), and design thinking (DT) are terms, which have been increasing the interest of scholars and practitioners. One of the reasons for this growing interest of academia and business professionals in entrepreneurship, BM, and DT is due to the connection of each term with innovation. Scholars of entrepreneurship, BM, or DT seek to develop academic analyzes aiming to establish some kind of connection with innovation. In the research fields of entrepreneurship, BM, and DT, there are vast academic papers, which establish the close connection between entrepreneurship and innovation.

Why is it relevant to investigate the relationships, connections or interfaces among entrepreneurship, BM, and DT in an integrated way in order to foster innovation in small and medium-sized enterprises (SMEs)? First, entrepreneurship can encourage the development of entrepreneurial skills of employees or business owners in order to facilitate innovation in the business. Second, BM is a tool, which expresses the creation and capture of value and fosters innovation in company. Third, DT is a tool, which encourages the opening of spaces for innovation, to solve problems, or to identify opportunities and to generate innovation among employees or owners with entrepreneurial skills.

However, few academic papers seek to explore the relationships or interfaces in integrated and interdependent ways among entrepreneurship, BM, and DT. Particularly, few scholarly articles examine the close links among entrepreneurship, BM and DT in an integrated way

to facilitate or to foster innovation in established SMEs. Scholars have paid little attention to investigate, in an integrated way, the close relationship or integrated connection among entrepreneurship, BM, and DT in order to foster innovation in SMEs. Therefore, there is a gap in the academic literature. This gap refers to the the lack of scientific knowledge, which helps to expand the understanding of the relationship or connection of the aforementiones concepts.

This study is guided by the following basic question: How should entrepreneurship, BM, and DT connected in an integrated way foster innovation in established SMEs? The research objective is to examine entrepreneurship, BM, and DT connected in an integrated way, to foster innovation in SMEs. Then, through SMEs case study analysis, it is intended to illustrate entrepreneurship, BM, and DT applied in an integrated way to foster innovation in SMEs.

The research is exploratory and qualitative supported by a case study (Eisenhardt, 1989; Yin, 2003). Based on literature review, the analytical framework was carried out, by identifying the main elements of entrepreneurship, BM and DT, considered the independent variables and dependent variable. For such a purpose, a Brazilian SME was selected. The main findings indicate that the analytical framework of entrepreneurship, BM, and DT connected in an integrated way, foster innovation in SMEs.

The article is divided into six sections. The first section deals with introductory elements, while the second section mentions methods and techniques. In the third section, there is the exploration of the main literature elements of entrepreneurship, BM, and DT, and in the fourth section, there is the case study. In the fifth section are the reseach findings and in the sixth section are the final considerations.

Methods And Techniques

The research is exploratory and qualitative supported by a case study (Eisenhardt, 1989; Yin, 2003). Four main steps were adopted in carrying out this research. In the first step, three types of articles were searched on the CAPES journal portal. The first search was for the concept of entrepreneurship, which is associated to the concept of innovation, the second search was for the term BM, which is connected with the concept of innovation, and the third search was for the concepts of DT and innovation. Then, articles, which establish some connections among entrepreneurship, BM, and DT were selected. In the field of entrepreneurship, among the articles analyzed, special attention was paid to the works of Schumpeter (1934), Shane & Venkataraman (2000), Gibb (2002) and Filion (1991). In the BM field, the main BM articles were analyzed, with an emphasis on the five V BM tool developed by Yariv et al. (2016). Among the articles selected by DT, attention was given to the works of Liedtka (2015) and Brown (2008).

In the second step, the development of the analytical framework was carried out, by identifying the main elements of entrepreneurship, BM, and DT, considered the independent variables, which appear in Figure 1. In the field of entrepreneurship, the main entrepreneurial skills were identified, by including opportunity, *weltanschauung*, vision, leadership, energy, and networking. In the field of BM, five elements were identified: value proposition, value segment, value configuration, value network, and value capture. In the DT analysis, five elements were identified: opportunity, idea generation, hypothesis testing, prototyping, and business model. From the elements identified in the literature, innovation was analyzed as a dependent variable.

In the third step, a Brazilian SME was selected for the case study. Then, data collection was carried out with interviews with the SME owner and employees. Information was also obtained from the company's main internal reports. Data collection in SME followed the case study protocol adopted by Eisenhardt (1989) and Yin (2003). The case study aims to illustrate the application of entrepreneurship, BM, and DT in an integrated way in Brazilian SME. The fourth step was the data analysis related to the case study of the SME.

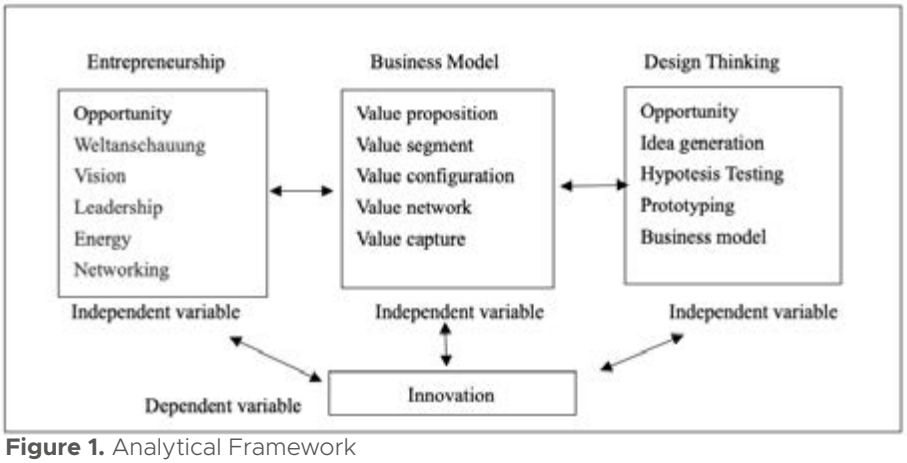

Figure 1. Analytical Framework

Literature Review

Entrepreneurship

Several academic studies of entrepreneurship establish interfaces with innovation (Soriano & Huarng, 2013; Bouncken et al., 2020; Herman, 2018; Arran & Brian, 2019; Berger et al., 2019). The papers of entrepreneurship linked to innovation, explicitly or implicitly emphasize entrepreneurial skills, as the essential and basic fuel (Gibb, 2002) for the realization of change, in the company, in the organization in general (Best & Eftimov, 2019; Barnard & Herbst, 2019; Kallmuenzer & Peters, 2018; Herman, 2018). The first studies of innovation were developed by

Schumpeter (1934), who associated it with one of the essential entrepreneurial skills of any company established. Innovation operates in a company, when employees or owners endowed with entrepreneurial skills, carry out creative destruction in order to develop disruptive solutions related to products, services, processes, and technologies in order to meet both consumer and business markets' needs, desires and demands (Schumpeter, 1934; Anderson et al., 2009; Zahra, 1991).

Employees or owners with entrepreneurial skills, in contemporary companies, implement innovative solutions by entrepreneurial opportunities as sources of innovation. Shane and Venkataraman (2000) highlight the idea that entrepreneurial opportunities involve discovering new means-end relationship, while the others set of opportunities refer to optimization of means-end structure. The discoveries and explorations of entrepreneurial opportunities originate from several phenomena, which occur in the internal and external environment of the company (Shane & Venkataraman, 2000; Phiri & Barnard, 2018; Finkle, 2012). In turn, entrepreneurial skills induce entrepreneurial action and practices, and they pave the way to several activities, such as co-working spaces as an instrument to foster innovation, by creating value and capturing value in established companies (Bouncken et al., 2020; Hampel et al., 2019; Brian & Derrick, 2019; Gaile et al., 2020).

Filion (1991) proposes the entrepreneurial metamodel comprised five entrepreneurial skills: *weltanchauung*, vision, leadership, energy, and networking. The first skill is *weltanchauung* considered the filter in which individuals capture tangible and intangible objects, formal and informal knowledge, and build mental models. The entrepreneurial mindset is stimulated at the level of the cognitive processes, which make up *weltanchauung* or cosmovision. The second component is vision. The notion of vision comprises a set of predetermined targets, such as products, services, processes, and technologies that are designed in the short, medium, or long term. Therefore, the notion of vision according to Filion (1991) is something tangible or intangible to build. The third component is leadership. The notion of leadership represents the act of awakening someone, who has no dream to have a dream, who has no vision to have vision and to mobilize scarce resources in order to achieve goals. The fourth component is energy, which represents the allocation of time to carry out activities. The fifth component is relation. Relation is developed through primary, secondary, and tertiary relationships.

According to the entrepreneurship literature analysis, two inferences are verified. In the first inference, opportunity, *weltanchauung*, vision, leadership, energy, and relationship are essential elements and independent variables, which

are connected with innovation. In the second inference, opportunity, *weltanchauung*, vision, leadership, energy, and relation are entrepreneurial skills that, when applied in the company, foster innovation.

Business Model

BM's academic literature emphasizes several articles related to innovation (Foss & Saebi, 2016; Foss & Saebi, 2018). Some of these BM articles mention market offering (Gobble, 2014; Keiningham et al., 2020; Maglio & Spohrer, 2013; Chesbrough, 2010; Sánchez & Ricart, 2010; Bouwman et al., 2019) and change (Euchner, 2016; Casadesus-Masanell & Zhu, 2013; Kraus et al., 2020; Poponi et al., 2020; Anwar et al., 2019) as two key aspects that facilitate innovation in company.

There is no agreement among researchers on the definition, but BM expresses a logic of value-based organizational architecture, made up of several interrelated components, in which these components create and capture value for customers and stakeholders (Teece, 2010; Fielt, 2014; Zott et al., 2011). The proposed definition of BM (Teece, 2010; Fielt, 2014) refers to the idea that BM brings together a constellation of specific activities, with a focus on creating, capturing, and delivering value to customers and stakeholders (Foss & Saebi, 2018). According to Foss and Saebi (2018), change in activities is the central point of the distinction between BM and BM innovation (BMI). While BM translates the notion of static into the company's activities, BMI emphasizes the notion of dynamics of change, compared to pressures from the internal or external environment to the company (Foss & Saebi, 2018; Wahyono, 2018).

Business model tools contribute to develop BMI in companies. One of these tools is the five V tool, which provides a set of propositions to foster innovation activities in company (Yariv et al., 2016). The five-V tool is made up of an ontology of BM, a structured list of successful decisions and implemented strategies by companies and a roadmap to foster innovation activities in the business model. According to Yariv et al. (2016) the five-V ontology has five elements: a) Value proposition: market offering, which a company of products and services for which customers are willing to pay; b) Value segment: the customer segments, which a company intends to serve. It also includes the interactions or relationships established with these customer segments; c) Value configuration: the efficient combination of key resources, key activities, and distribution channels necessary to create and to deliver the value proposition to the selected value segment in an economic manner; d) Value network: it identifies the network of partners, who are involved in different types of cooperation with a company in order to obtain economies of scale, to risk reduction and/or to take advantage of new knowledge or resources; e) Val-

ue capture: it describes how and how much customers pay for the products / services offered.

The literature review of BM allows us to identify two inferences. In the first inference, the five elements of BM made up of value proposition, value configuration, value network, and value capture are independent variables, which are related to innovation. In the second inference, the five elements of BM are the following: value proposition, value configuration, value network and value capture, when applied in the company, foster innovation.

Design Thinking

One of the reasons for the growing interest in DT by scholars and practitioners is due to its breadth and depth to facilitate the generation of innovative solutions in the organization. The DT articles selected for our analysis since there are some interfaces or connections with innovation. They were sorted out into two groups. In first one has articles, which emphasize the notion of value to drive innovation (Leavy, 2010; Leavy, 2012; Ward et al., 2009; Cankurtaran & Beverland, 2020). The second one has articles, which highlight change as one of the ways to pave the way for innovation in the company (Liedtka, 2011; Beverland et al., 2015; Zheng, 2018; Liedka & Kaplan, 2019; Johansson-Sköldberg et al., 2013; Micheli et al., 2019; Nakata, 2020).

DT is a methodology made up of methods, techniques, and spaces for innovation, which focuses on solving problems for users and customers. DT allows us to mobilize sources of innovation (Drucker, 2002) to increase the possibilities of developing solutions in company, by including products, services, processes, and technologies (Nakata & Hwang, 2020). The value propositions of solutions designed by DT in company solve user and customer problems, by fulfilling needs and desires, by modifying attitudes and behaviors towards the designed solutions (Carlgren et al., 2016). The incremental innovation or disruption of innovative solutions provided by the DT are associated with the notion of creating value and increasing the results of innovation.

The mechanisms, processes, and spaces of innovation and the thinking strategy, which integrate DT adopted in problem solving can reduce the level of cognitive inclination of managers and increase the results of innovation (Liedtka, 2015). Brown (2008) proposes that DT is made up of three continuous innovation spaces. The first space is about inspiration, which involves understanding the user's problem and the context involved. The second innovation space refers to ideation, the search for ideas, which aim to solve the problem outlined together with the development of prototyping solutions. The third innovation space is the implementation of the solution.

Another DT tool is the EDLE tool – Entrepreneurial Dynamic Learning (Aranha et al., 2018), which establishes five interconnected innovation spaces, which interact with each other. The first inno-

vation space involves the formulation of the problem, challenge, or opportunity, which seeks to map the user's cognitive processes and the context in which it is inserted, by aiming to identify needs, desires, and demands. The second innovation space is the process of generating ideas to solve the problem, challenge, or opportunity mapped. The third space is the definition of hypotheses for solution. The fourth space is the prototyping solution, and the last innovation space is the business modeling innovation with the designed solution.

According to the DT literature review it is possible to draw two inferences. In the first inference, the five innovation spaces integrated of opportunity, idea generation, hypothesis testing, prototyping, and business model are elements that promote innovation and are independent variables strictly linked to innovation. In the second inference, opportunity, generation of ideas, hypothesis testing, prototyping, and business model, when applied in the company, foster innovation.

Case Study

Case Study Protocol

Guided by the analytical framework and the basic question, the literature analysis enabled the mapping of dependent and independent variables in the research of how entrepreneurship, BM and DT, in an integrated way, in the SME can foster innovation. The dependent variable analyzed is innovation. Independent variables in the entrepreneurship field are the main entrepreneurial skills, by including opportunity, *weltanschauung*, vision, leadership, energy, and relation (Filion, 1991; Shane & Venkataraman, 2000). In the BM field, the independent variables are value proposition, value segment, value configuration, value network, and value capture (Yariv et al., 2016). In DT, the mapped independent variables are the five innovation spaces, which integrate opportunity, idea generation, hypothesis testing, prototyping, and business model (Brown, 2008; Liedtka, 2015; Aranha et al., 2018).

The case study aims to illustrate how entrepreneurship, BM, and DT, in an integrated way, can foster innovation in SMEs. The data collection protocol of the case study of an SME (Eisenhardt, 1989; Yin, 2003) contributes towards obtaining empirical evidence, which makes it possible to verify the external validity and reliability (Yin, 2003). The data collection protocol was designed in five main phases. In the first phase, entitled problem or opportunity, it was collected information about the company through interviews with the owner, employees, and also through the company, reports in order to map problems and opportunities. In this phase, the mapping of the BM of the current situation of the SME was carried out, which is called the old business model. From the analysis and reflection of the information obtained from the company, only one problem or opportunity of greater impact on the reduction of the company's performance was identified.

In the second phase, which is called idea generation, was developed with new decisions and strategies to deal with the main problem or opportunity. The third phase was called decisions, strategies, and hypothesis craft and the fourth phase was the development of the solution prototype. The fifth phase was the modeling of business model innovation, which we call the BM innovation. The official name of the company will not be mentioned in this study. The name XCO is a fictitious name and was adopted to designate the SME case study.

The XCO SME (It is important to define what is meant by XCO in this particular context)

The XCO SME is a potato processor, an industry operating in the food business located in Brazil. Its focus is to produce straw potatoes, by using the best potato varieties for this final product. The process adopted and the frying process is completely handmade, by using the "kettle cooked" method. In the "kettle cooked" method, the employee responsible for frying, take care of the potatoes in small batches, at a lower temperature than the one used in the market and for a longer time, by ensuring color, crispness, and natural flavor to potatoes.

The SME had 16 employees, and it was able to produce 31,000 products per month. However, the average demand was around 32,800. That is to say, the company was only able to fulfill 92% of orders. The revenue, cost, and working capital of the company were as follows: Revenue on average of Brazilian corresponds to R$ 7 million per year (85.12% - costs and 14.88% - profit), working capital of R$ 88,958.43 monthly, current liquidity ratio is equal to 1.23. Average ticket for products: R$ 18.83; contribution margin: 74.50%; break-even point: 24,787 units/month; safety margin: 6,214 units/month; losses: for each 1 kg produced, the company uses 1.75 kg of raw material; company stock and production: approximately 2.5 tons/day; average inventory turnover: 92%; average utilization rate of the production line: around 63%;

Case Analysis

According to the data collection protocol, in the first phase, the empirical data collected from the company regarding the current situation makes it possible to carry out the business modeling, which is called the old business model. In this first phase of the data collection protocol, the business modeling was performed, by adopting the five V tool, shown below: a) Value Proposition - The company offers 11 different straw potato models in its product range, in addition to the potato chip models. The price of potatoes is also very competitive compared to competitors. For example, the the 100g of straw potato costs R$ 2,30 on the market, while certain competitors sell the same 100g for R$ 4,17; b) Value Segment - The products sold by the company are directly aimed at Brazilian demographic classes B, C, and D and for

companies, which use straw potatoes in their products. They are usually, sold in large quantities. The Assaí Kauã 1kg potato line (largest package) is the most sold and accounts for 30% of the company's revenue; c) Value Configuration - The company currently sells its products in supermarket chains and wholesale chains. In addition, the company is present in more than 6 Brazilian states (Minas Gerais, São Paulo, Mato Grosso, for example). For the wholesale chain Assaí alone, the company serves 64 stores; d) Value Network - From the beginning of its activities, the company has always kept up to date in relation to the inputs used. For example, recently the company has replaced all the machinery and part of the raw material, by aiming to achieve higher quality and productivity. R$ 1.500.000,00 was invested in cutting-edge equipment to automate the line; e) Value Capture – Charge the customer for metered services (products) based on current usage. The company charges/receives from its customers according to product sales. The average deadline for receiving large volume sales is 28 days.

The executions of the second, third, and fourth phases of the data collection protocol enabled the design of innovation strategies for each component of the BM shown below: a) Value Proposition - Customized model options along with competitive prices. Quality selling. High quality or rare products are sold for premium prices; b) Value Segment - Target the poor. - The product or service offering does not target the premium customer, but rather, the customer positioned at the base of the pyramid. Benefit from the higher sales numbers that usually come with the scale of the customer base. Making contacts, which may lead to a sale or other favorable outcome, i. e. referring customers to a business. (Lead generator); c) Value Configuration - A collection of shops or e-shops, usually enhanced by a common umbrella. Integrator. Be in command of the bulk of the steps in a value-adding process, by controlling all resources and capabilities in terms of value creation; d) Value Network - Gather value e. g. information form external sources, such as innovation partner and research communities; e) Value Capture - Charge the customer for metered services based on actual usage.

After the development of the data collection protocol of the first phase and after the execution of the second, third, and fourth phases, in the fifth phase, the solution to the problem was developed and also the innovation of the business mode, which is found in Figure 2, was developed. In the five phases of the execution of the data collection protocol, the operation of entrepreneurial skills verified as independent variables is shown, which are opportunity, *weltanschauung,* vision, leadership, energy, and networking (Filion, 1991; Shane & Venkataraman (2000). To identify problems or opportunities, it is necessary to have the entrepreneurial mindset, which is rooted in *weltanschauung.*

Through *weltanschauung,* which is made up of the entrepreneurial mindset, paves the way for the search for opportunities. *Weltanschauung* and opportunity are operationalized through the perception that a problem is an entrepreneurial opportunity. The vision can refer to products, services, processes, or technology, which are developed in the short, medium, or long term. In this case study, vision is operationalized in two ways. First, vision is operationalized, in the first phase of the data collection protocol, in which one of the main results is the old BM, which is based on information collected from the SME. The old BM is made up of main strategies, actions, problems, and opportunities implemented by SME that impact to achieve the best results. Second, the vision is operationalized, in the last phase of the data collection protocol, through the innovative solution, which is designed in the new business model, and it refers to BM innovation.

Leadership is operationalized, not only in the ability to adopt a logical approach, which makes it possible to pursue the development of the vision, but also in mobilizing information resources that will lead to achieving the objective of fostering innovation in the company through a new business model. The leadership of the project carried out was operationalized, by pursuing the results of each phase of the data collection protocol. Energy represented the time of dedication necessary for the effective realization of the entrepreneurial vision. Relation was made operational through the relationships made with employees and owners in order to reach the final objective, which is the insertion of innovation in the new BM. Therefore, the independent variables, which were made up of opportunity, *weltanschauung,* vision, leadership, energy, and relation, were operationalized, and fostered BM innovation.

BM was operationalized in two phases of the data collection protocol aimed at BM innovation. The five V ontology enabled the demonstration of the operation. In the first phase, the main empirical information on the company's current situation was modeled using the five BM components, which are value proposition, value segment, value configuration, value network, and value capture. This modeling was called the old business model. In the last phase of the data collection, the BM innovation was designed.

DT was also operationalized in the case study. In planning of the research protocol, it was adopted in five phases, five innovation spaces according to DT. At each phase, innovation is seen as a central element of solution development. The last phase of DT refers to business modeling, which is considered to be as the innovation of the solution found. There are two interfaces or connections of DT with BM. The first interface is in the first phase of DT, in which one of the results of the first phase is the design of the current business model, which is called the old business model. The second DT interface with BM is that in the last DT

Figure 2. New Business Model Innovation

New Business Model Innovation				
Value Proposition	**Value Segment**	**Value Configuration**	**Value Network**	**Value Capture**
The company offers 11 different straw potato models in its product range, in addition to the potato chip models. The price of potatoes is also very competitive compared to competitors. For example, the potato of a specific line of 100g of the company costs R$ 2,30 in the market, while certain competitors sell the same 100g for R$ 4,17. As a business strategy, the company always aims for higher quality products and superior presentation. With the implementation of the first in-first out methodology in the inventory, the products reach the final consumer with a higher quality since they are perishable. The sooner they reach the final consumer, the better their quality and presentation will be.	The products sold by the company are directly aimed at classes C and D and for companies, which use straw potatoes in their products. Usually sold in large quantities. After implementing improvements in the productive sector, the company started to meet 100% of its monthly demand. Seeking to expand this demand, since it now has the capacity to produce more, the owner started to make new contacts with possible customers, here understood as large wholesalers.	The company currently sells its products in supermarket chains and wholesale chains. In addition, the company is present in more than 6 Brazilian states (Minas Gerais, São Paulo, Mato Grosso, for example). For the main wholesale chain alone, the, the company serves 64 stores. With the implementation of new areas and improvements in the production line, the company started to command more than 90% of its production chain. It is worth mentioning that the company's long-term objective is to command 100% of the production chain through the implementation of its own logistics.	Since the beginning of its activities, the company has always kept up to date in relation to the inputs used. For example, at the beginning of the year, the company replaced all the machinery and part of the raw material, aiming at higher quality and productivity. R$ 1.500.000,00 was invested in cutting-edge equipment to automate the line. During the implementation of the improvements, the team of consultants most often sought solutions from sources outside the company. For example, with the implementation of the first in-first out methodology for inventory management.	Pay-as-you-go (Johnson, 2010) - Charge the customer for metered services based on current usage. The company charges/receives from its customers according to product sales. As a strategy, after implementing the improvements, the company chose to keep the average deadline for receiving sales equal to 28 days.

phase, one of the results is the modeling of the company's innovation through DT. Therefore, in addition to pursuing innovation through DT, in the first and last phases of DT, it makes it possible to pursue BM innovation.

Findings

the research indicates two main findings. The first main finding is the integrated analytical framework. The literature review contributes to the development of the analytical framework. According to the analytical framework, the independent variables of entrepreneurship compose of opportunity, *weltanschauung,* vision, leadership, energy and relation (Filion, 1991; Shane & Venkataraman, 2000), connect with the independent variables of BM that are value proposition, value segment, value configuration, value network, value capture (Yariv et al., 2016) and also,

the independent variables of DT that are opportunity, idea generation, hypothesis testing, prototyping, and business model (Brown, 2008; Liedtka, 2015; Aranha et al., 2018), when connected in an integrated way in SME, fosters the variable dependent of innovation.

The second main findings refer to the illustration of the operation of entrepreneurship, BM and DT connected in an integrated way in the SME through the analytical framework. The main empirical evidence from the XCO SME case study illustrates the operation, in an integrated way, of the independent variables of entrepreneurship, BM, and DT and the causal relationship with the dependent variable. The design of the old business model, strategies design, and the innovation designed in the BM innovation (Figure 2) illustrate the operation of entrepreneurship, BM and DT in an integrated way in XCO SME. The findings obtained in the study provide elements to answer the basic research question, which refers to how entrepreneurship, BM, and DT, in an integrated way in the SME, can foster innovation.

Final Considerations

Mansoori and Lackéus (2020) emphasize that prescriptive methods, based on prescriptive theories of action, help people to decide what to do and how to think, due to the pragmatic nature of action and application. Methods, framework, tool, or model bring together a structured set of steps, articulated in a systemic way, in order to achieve a defined objective (Mansoori & Lackéus, 2020).

This prescriptive study of entrepreneurship, BM and DT applied in an integrated way in SME sheds some light towards: (a) build of an integrated logical structure for deciding what to do in order to foster innovation, based on the integrated interfaces among entrepreneurship, BM and DT; and (b) how to think the pragmatic nature of action and integrated application in the SME, towards fostering innovation (Mansoori & Lackéus, 2020).

Following the principles proposed by Mansoori and Lackéus (2020) of prescriptive methods, based on the theory of action, this study adopts an entrepreneurial framework, tool or model, BM and DT to anchor the exploration of independent and dependent variables proposed in the analytical framework, by aiming to verify how entrepreneurship, BM, and DT, in an integrated way, foster SME innovation. In the field of entrepreneurship, the prescribed methods adopted are the entrepreneurial metamodel of Filion (1991) and the opportunity framework of Shane and Venkataraman (2000). In BM field, the five V tool is adopted (Yariv et al., 2016) and in DT field, the entire prescriptive methodological body is also adopted (Brown, 2008; Liedtka, 2015; Aranha et al., 2018).

The research findings are innovative and have several practical implications. The findings are innovative and contribute to the production of new theoretical

and pratical knowledge, by involving the relations and connections among entrepreneurship, BM, and DT in an integrated way, applied in the company, in order to foster innovation. The findings are innovative because they help to fill the gap in the literature. According to the initial survey of academic literature, there is a large number of academic articles of entrepreneurship, BM, and DT. However, entrepreneurship, BM and DT are far apart from each other in the academic literature. There is a lack of studies that seek to analyze the application of the three fields in an integrated way in company in order to foster innovation.

The findings have several practical implications. Only four of them will be highlighted. In the first implication, owners and managers in established SME will be able to use the findings in order to develop awareness programs among employees about entrepreneurship, BM, and DT applied in an integrated way to foster innovation. In the second implication, human resources coordinators and managers will be able to develop training programs for employees about entrepreneurship, BM, and DT in an integrated way to develop entrepreneurial skills and help the company to design innovative solutions. The third and fourth practical implications are related to the enrichment of the development of undergraduate students at higher educational institutions (IES). In the third implication, rectors, directors, and coordinators of undergraduate programs will be able to integrate entrepreneurship, BM and DT, in the curricular components of undergraduate programs. In the fourth implication, undergraduate and graduate professors will be able to develop lectures, games, challenges, and new pedagogycal strategies, which encourage the learning of entrepreneurship, BM and DT in an integrated way to innovate in the company.

What are the areas for further research? Entrepreneurship, BM and DT connected in an integrated way to foster innovation in established SME is fertile field of research. The findings obtained in this research open up areas for futher research and only three areas will be highlighted. First, the inclusion of more Brazilian SMEs in new studies will expand the empirical data, by making it possible to examine how the independent variables of entrepreneurship, BM, and DT in an integrated way can foster innovation. Second, it is important to develop studies, with more Brazilian SMEs, to identify if there are new potential independent variables of entrepreneurship, BM, and DT, and to analyze how these new variables along with those identified in this present study can foster innovation. Third, from the expansion of new SMEs in the study, examine other potential independent entrepreneurship, BM, and DT variables, which can foster innovation in established SMEs.

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