

The Contribution of the Dynamic Capabilities to Promote Sustainability in Industrial and Service Companies

A Contribuição das Capacidades Dinâmicas para Promover a Sustentabilidade em Empresas de Indústria e Serviço

Bruna Carolina Pospichil¹
Universidade Feevale
b.pospichil@hotmail.com

Cristiane Froehlich¹
Universidade Feevale
cristianefroehlich@hotmail.com

Cristiane Hermann Nodari¹
Universidade Feevale
cristine.nodari@gmail.com

Serje Schmidt¹
Universidade Feevale
serje@feevale.br

Raquel Engelman Machado¹
Universidade Feevale
raquelengelman@gmail.com

Abstract: The objective of this research is to identify the contribution of dynamic capabilities to promote sustainability in companies located in the regions of Vale do Sinos and Paranhana, in the state Rio Grande do Sul, Brazil. The study is an exploratory and qualitative research through a study of multiple cases. The primary and secondary data collected were analyzed using qualitative content analysis. It was found that dynamic capabilities can be addressed through the six subcapabilities of Day and Schoemaker (2016) and operationalized by elements presented by Teece, Pisano and Shuen (1997) and Teece (2007, 2014) as trajectory, position and organizational processes. Sustainability practices performed by the investigated companies were

¹ Universidade Feevale — Rodovia RS-239 – CEP 93525-075 – Novo Hamburgo (RS) – Brasil
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identified and they relate to each one of the six sub-capabilities. The companies operate directly with the three pillars of sustainability by performing actions in order to reach each one of them and maximise its sustainability results. By exposing the context, the vision of the future, training and self-responsibility are characterized in an exploratory and constructive way for the process of development of sustainability.

Keywords – Dynamic Capability; Sub-capabilities; Sustainability.

Resumo: O objetivo dessa pesquisa consiste em identificar a contribuição das capacidades dinâmicas para promover a sustentabilidade em empresas situadas nas regiões do Vale do Sinos e Paranhana no Rio Grande do Sul. O estudo trata-se de uma pesquisa exploratória e qualitativa por meio de um estudo de casos múltiplos. Os dados primários e secundários foram analisados por meio da análise de conteúdo qualitativa. Constatou-se que as capacidades dinâmicas podem ser abordadas por meio das seis subcapacidades de Day e Schoemaker (2016) e operacionalizadas pelos elementos apresentados por Teece, Pisano e Shuen (1997) e Teece (2007, 2014) como trajetória, posição e processos organizacionais. Foram identificadas práticas de sustentabilidade executadas pelas empresas pesquisadas que se relacionam com cada uma das seis subcapacidades. As empresas investigadas atuam diretamente com os três pilares de sustentabilidade, realizando ações para atender cada pilar e potencializar seus resultados de sustentabilidade. Com o contexto exposto, a visão de futuro, o treinamento e a autoresponsabilização caracterizam-se de forma exploratória e construtiva para o processo de desenvolvimento da sustentabilidade.

Palavras-chave – Capacidade Dinâmica. Subcapacidades. Sustentabilidade.

Introduction

The topic of sustainability has become recurrent in the companies' as an aspect of differentiation in strategies in the past few years. One of the greatest challenges for the 21st century companies is to align economic growth, environmental conservation and social equity (Gatto, Santos & Araújo, 2016). Corporate sustainability consists of a set of actions adopted by a company, which values the balance between respecting the environment, the social development and the company's financial outcomes at a short, medium and long term (Rezaee, 2018). Therefore, when perceiving the complexity of the sustainability theme, one observes the strategic, dynamic and innovative dimension that this represents for organizations.

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Whereas sustainability can be internally influenced by a series of capabilities that the company has developed over its lifetime. These internal capabilities are strongly related to such as the company's organizational processes, path and position (Teece, Pisano & Shuen, 1997; Teece, 2014). Dynamic capabilities are the capacity to identify and seize opportunities and reshape the internal assets for a constant evolution with the objective to reach a sustainable competitive advantage (Teece, 2007, 2014). Although there are already some initiatives, theoretical and practical advances on the relationship between sustainability and available capacity are still limited (Castiaux, 2012; Froehlich, 2014; Mazza, Isidro-Filho & Hoffmann, 2014; Amui et al., 2017; Mathivathanan, Govidan & Haq, 2017; Takahashi, Rosa & Bulgacov, 2019). Moreover, the interpretation in terms of operationalisation of the dynamic capabilities is vulnerable (Mosakowski & Mckelvey, 1997; Arend & Bromiley 2009; Zahra, 2019).

In this sense, it is possible to consider the opportunity of studies that relate the themes dynamic capabilities and corporate sustainability, especially in emerging economies, with a comparative focus between the manufacturing and services sector (Amui et al., 2017). In order to contribute to and close this gap on the relationship between dynamic capabilities and sustainability, the question which guides this research is: what is the contribution of the dynamic capabilities to promote firm sustainability? Therefore, the main objective of this study is to identify the contribution of dynamic capabilities in order to promote sustainability in companies in the regions of Vale do Sinos and Paranhana in the state of Rio Grande do Sul, Brazil. To achieve the general objective, it was necessary to develop a conceptual scheme that supports the association between these constructs from a theoretical review. In addition, it was necessary to identify sustainability actions in the investigated companies as well as to identify characteristics of the companies related to the six sub-capacities of Day and Schoemaker (2016). This investigation, which has an exploratory nature, was led through a multiple case study with a qualitative data analysis.

The option for carrying out the study in companies located in these areas was based on their economic representativeness and relevance to the State of Rio Grande do Sul. The choosing of companies from different dynamic sectors supported their representation in the economy in different

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ways. Industry is strongly influenced by manufacturing, whereas service is strongly influenced by client's service, which constitutes different organizational capabilities' development logics, whether about company's path, position or organizational processes. With 24 municipalities, the regions of Vale do Sinos and Paranhana have a Gross Domestic Product (GDP) of approximately R\$ 45.05 billion, which represented 13.6% of the State of Rio Grande do Sul (RS). The regional distribution of the Gross Added Value of the regions shows the concentration and representativeness of the industry (28.3%) and services (70.9%) in relation to agriculture (0.8%) (Corede, 2017; Consinos, 2017; Pessoa, 2017).

Other criteria for selecting the participating companies were: (a) they must be a medium or large company since companies of these sizes usually have an internal structure that is developed and formalised; (b) the companies' sustainability must be inserted in their strategies in order to prove the sustainability's strategic importance; (c) they must be awarded with prizes or certifications related to sustainability in order to show representativeness in their segment and compete in a dynamic market by meeting sustainable matters; (d) they must be an industrial or service company, since these sectors represent the region's economy. This research covered companies which developed a sustainable perspective in their business strategy by holding on to three pillars: social, environmental and economical.

The relevance of the research is anchored in the organizational perspective in which it intends to contribute to the administration area, promoting information on how organizations, from their capacities, can come to combine resources and routines of the organization to leverage the sustainability. Thus, it becomes important for local and regional companies to understand these aspects in order to develop value, creating resources and capacities over time, reaching congruence with a constantly evolving environment (Güttel, Konlechner & Müller, 2011) as in sustainability perspective. Furthermore, in the academic perspective, with the introduction of the theoretical lens on dynamic capabilities, it aims to fill a gap associated with the development and maintenance of sustainability in organizations as a result of sustainable competitive advantage (Yunus & Michalisin, 2016) with the proposition and empirical analysis a from a conceptual scheme.

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Corporate Sustainability

One of the biggest challenges for an entrepreneur in the 21st century is to combine economic growth, environmental preservation and social equity (Gatto et al., 2016), since sustainability's acceptance and integration in entrepreneurial routines have been integrating a meaningful impact into the companies' strategies and operations (Dyllick & Muff, 2015).

In companies, sustainability consists of a set of internal actions with the objective to respect the environment and promote social development (Gatto et al., 2016). To Rezaee (2018), business sustainability means creating a balance between short-, medium- and long-term continuous improvement for the parties interested. Executives agree more and more that the sustainable practises are necessary in order to keep competitiveness today and in the future (Dyllick & Muff, 2015) due to their several benefits, such as improving the company's reputation, complying with social responsibility and promoting the corporative culture of integrity and competence (Rezaee & Rezaee, 2014).

The efforts towards green economy are on the rise through the insertion of natural capital into economy, which internalises some productive and development actions, and respects nature and people (Folke et al., 2016). For this, the proposed theoretical model covered the organizational environment under the three pillars of sustainability: the economic pillar contemplates business strategies, quality of products and services, costs, results and competitive advantages, whereas the environmental pillar acknowledges the human being's impact over the ecosystem, and the social pillar refers to the integration between companies and people by preserving human values, welfare and ethical issues that complement the taking of decisions (Hanieh, Abdelall & Hasan, 2016).

Therefore, companies that search for a sustainable management need to understand the demand to reach these three pillars of sustainability as a tripod, by developing a system that is economically sustainable, and producing products and services without causing any harm to fiscal or financial grounds. Moreover, this system needs to be socially sustainable, which means promoting fair income

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and distribution of opportunities through social, educational and health services, and by treating everyone equally. Also, it must be concerned with the sustainable environment without undermining the basis of renewable and non-renewable resources in order to keep the biodiversity, the atmosphere's stability and the remaining ecosystem's functions (Harris et al., 2001; Caiado, Quelhãs & Lima, 2015).

Through this new paradigm, companies need to expand their mission and strategies, not only to make profit and create value, but to generate a shared value for all those involved (Rezaee, 2018). This way, the use of strategies that connect the social, economic and environmental pillars can and must generate benefits. With this perspective, the theoretical model proposes that sustainability relates to a considerable extent with the dynamic capabilities of Sensing, Seizing and Transforming (Teece, 2007), at a deep level to assume sub-capacities (Day & Schoemaker, 2016) in use of strategies that reach sustainable pillars. In this sense, when addressing the theories of dynamic capabilities and sustainability, one can contribute to the debate on how to develop strategies and sustainability actions in organizations through dynamic capabilities (Amui et al., 2017). According to Khoshnava et al. (2016), the main benefits are presented in Table 1.

Economic pillar	Decrease operational costs; create, expand and mould markets for green products and services; improve productivity; and improve the economic life cycle.
Environmental pillar	Protect ecosystems; improve air and water quality; decrease water and land waste flows; and preserve natural and renewable resources.
Social pillar	Improve people's comfort and health; minimize pressure over local infrastructure; and improve life quality in general.

Table 1. Sustainability Benefits

Source: Adapted from Khoshnava et al. (2016).

Schrettle et al. (2014) say that sustainability represents a change that requires reorganizing the characteristics of the sector to meet the required demands. Due to the complexity of the subject, studies are needed on how companies could maintain long-term sustainability strategies and actions (Chakrabarty & Wang, 2012; Hahn et al., 2015). Thus, being a sustainable company is a “two-way lane”, for the company simultaneously contributes to society and also benefits from it (Gatto et al.,

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2016). Nonetheless, companies still face challenges about investment in sustainability since, in several cases, their resources are scarce for such objective (Rezaee, 2018). The economic issue still has ruled the taking of decisions due to human nature inertia. In this sense, in order to deal with market complexity, companies search for ways to boost sustainability in their internal environment through dynamic capabilities that relate to new business models. Amui et al. (2017) report that research on sustainability is generally statistical and focused on socio-environmental practices. In view of this, the authors reinforce the need for sustainability to be perceived in a more strategic, dynamic and innovative way, in order to become a differentiating factor.

Dynamic Capabilities

The globalised markets and the acceleration of changes are challenges currently faced by companies. To the competitors, the competitive advantage is temporary and needs constant adaptation, as well as knowledge and action renovation. The concepts and paradigms are easily broken and need constant adaptability. Thus, how to compete in such a dynamic market? What are the dynamic capabilities the companies need to develop?

The dynamic capabilities' approach was developed with the seminal article "Dynamic Capabilities and Strategic Management" by Teece, Pisano and Shuen (1997). The authors conceptualise dynamic capabilities as those that identify and seize opportunities and reshape the internal assets for constant development, with the objective to reach a sustainable competitive advantage.

The external environment evolves and, in the meantime, the organizations need to constantly renew their stocks of valuable resources (Ambrosini & Bowman, 2009) with the objective to mould the space it takes, develop new products and processes, and project and implement feasible business models (Teece, 2007). When an organization identifies a promising opportunity and reaches a performance that is higher than that of their competitors, this works as an empiric indicator of competitive advantage

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(Schilke, 2014). This usually requires making good use of the several types of internal resources (Sotarauta, 2016).

The companies that notice possible threats or emerging opportunities are more likely to adapt to volatile markets, technological uncertainties and business unpredictability (Day & Schoemaker, 2016) by mobilising the recombination and development of the resources that are applicable to their needs (Helfat et al., 2007; Munck, Silva & Borim-de-Souza, 2015). However, the fear to interrupt existing processes and systems limits changes in several cases (Zahra, Sapienza & Davidson, 2006). From that, consistent and fruitful routine procedures are necessary in order to be a reference in the construction of a learning process and in the introduction of changes (Nieves & Haller, 2014).

Therefore, the dynamic capabilities are strictly related to the changes in the organizations' internal components (Barreto, 2010). Among the elements mentioned by researchers in the area, the emphasis lies on resources and capabilities (Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece et al., 1997; Winter, 2003), operational routines (Zollo & Winter, 2002), and resources and routines (Zahra et al., 2006). Most of the organisations are able to store a large stock of assets and resources; even so, they lack useful capabilities (Teece et al., 1997; Zahra et al., 2006; Sotarauta, 2016).

Dynamic capabilities are supported up by micro-foundations, a concept that is relevant in this context, since they refer to routines and processes which allow the implementation of dynamic capabilities (Froehlich, Bitencourt & Bossle, 2017). In this research, the three dynamic capabilities by Teece (2007, 2014) were used in order to identify, seize and transform opportunity in the version addressed by Day and Schoemaker (2016), which, in their research, organise six sub-capabilities: peripheral vision, vigilant learning, probe and learn, flexible investing, organizational redesign and external shaping. These six sub-capabilities can be considered as a source of sustainable competitive advantage if they are developed through skills that are difficult to imitate and that are rooted in the organisation, based on the knowledge accumulated and held through separated internal activities (Day & Schoemaker, 2016). Based on that, Table 2 presents the integration of propositions.

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Dynamic Capability	Dynamic Capabilities' Definition (Teece, 2007; Teece, 2014)	Dynamic Sub-capability	Dynamic Sub-capability Definition (Day & Schoemaker, 2016)
Identify	<ul style="list-style-type: none"> - Identify and evaluate internal and external opportunities: sensing; - Find out how to interpret new events by checking on markets to be segmented; - It is part of the individual's creation and knowledge + previous experiences + research and development; - Characteristic: entrepreneur. 	Peripheral Vision	<ul style="list-style-type: none"> - Notice potential opportunities and emerging threats before the competitors; - How? Learn from the past by analysing blind spots and cases with other companies; - How? Learn with the present by identifying something no one has noticed.
		Vigilant Learning	<ul style="list-style-type: none"> - Interpret the opportunity in an exploratory and vigilant way; - How? Through market orientation; - How? By identifying those who hold the knowledge that could generate value but who don't share it. - How? By overcoming factors which inhibit the interpretation of ambiguous information; -How? By considering at least three opinions upon solving a complex issue.
Seize	<ul style="list-style-type: none"> - Mobilise resources to work on opportunity - apprehension; - Identify the application of the opportunity (products, processes, services); - In order to accomplish that, create, adjust, improve and, whenever necessary, replace business models - Characteristic: administrative. 	Probe and Learn	<ul style="list-style-type: none"> - Try out small plannings which may generate positive results; - Challenge existing beliefs and rely on teams that are capable of sharing their perceptions; - Rely on a culture where mistakes are tolerated and even encouraged sometimes.
		Flexible investing	<ul style="list-style-type: none"> - Deeply investigate issues before investing; - Choose to invest in options which may generate real deals.
Transform	<ul style="list-style-type: none"> - Continuous renewal; - Development of the sustained profitability; - Recombine and reconfigure assets and internal structure aiming at constant development; - Characteristic: leadership. 	Organizational redesign	<ul style="list-style-type: none"> - Try out within limits and new organizational models; - Test new approaches; - Benefit from existing resources and experiences.
		External shaping	<ul style="list-style-type: none"> - Transform and mould the external environment; - Connect with people which are connected through their networks; - Advance into knowledge sharing; - Open businesses of several ecologies.

Table 2. Dynamic Capabilities and Sub-Capabilities

Source: Elaborated by the authors.

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In this sense, identifying the emerging threats and opportunities is essential for the development of a company's capability to adapt to volatile markets, technological uncertainties and unpredictable competitors. This demands constant vigilance through research and exploration, investments in relevant technologies and intelligence in order to operate each part of the process (Day & Schoemaker, 2016). Upon adopting the six sub-capabilities, it is possible to consider two or even more sub-capabilities (depending on the context). However, the fact a company develops a sub-capability doesn't always mean it will have necessarily developed another. For example, in the dynamic capability named identify opportunities, a company may have an excellent peripheral vision to identify possible operation opportunities but may not interpret them in an exploratory way.

With this context, and upon adjusting the sustainability components, it becomes important to observe that the elements presented by Teece et al. (1997) and Teece (2007, 2014), such as path, position and organizational processes, are important for the development of the dynamic capabilities.

Concerning path, there is the company's future perspective due to its current position and directions to follow. The current position is moulded by the direction it has followed so far, so its previous investments and the routines that were previously defined represent part of the organization's future behaviour (Teece et al., 1997; Pisano, 2017). To this end, a consistent strategy becomes necessary, one that is consistent with and focuses on innovation. Although a major part is moulded by a legacy of the past, it is important to remould the direction ahead. Thus, the strategy will determine the products to be manufactured, the clients' segment to follow, and the methods through which the company's resources should be implemented, and how to keep the competitors away (Teece, 2014). Position, on the other hand, is strongly influenced by the organization's path and becomes limited by its current stock of resources (Pisano, 2017). Position is not defined only by their specific assets (structure and equipment, market reputation and its relationships), but also by learning processes and human capital and knowledge assets (Teece et al., 1997). Usually, position offers value to the company and, to the parties interested, it presents a differential that is attractive to the client and is not easily copied by competitors (Teece, 2014).

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The organizational processes are related to coordination/integration (static process), guided learning (dynamic process), and reconfiguring (transformational concept) (Teece, 2007). Therefore, the organizational processes may be implemented in order to gather new technical information, explore developments in science, monitor clients' needs and competitors' activities, and mould new opportunities of products and processes (Teece, 2007), that are strongly influenced by a set of routines (governance structure, resources' allocation, and management systems, among others) which mould the organizational adaptability (Pisano, 2017). They partly lie on managerial, entrepreneurial and leadership skills from the company's high administration and capability to design projects, develop, implement and modify routines. It should be mentioned that the organizational processes' efficacy is supported by strong and consistent organizational values (Teece, 2014).

Therefore, the aspects of path, position and organizational processes are directly related and also configure the link with the entrepreneurial sustainability development, where the result will lie on the perception of the different parties interested and of the consumers, on the choice for sustainable products and services consumption and even on the organizations, development and communication of good practises (Miranda et al., 2019).

The dynamic capabilities may contribute to corporate sustainability when sustainability is included in the business strategy. This research encompasses several factors with the objective to generate possible differentials before the competitors. The theoretical framework suggested by this research is presented below. It inter-relates the dynamic capabilities to the corporate sustainability.

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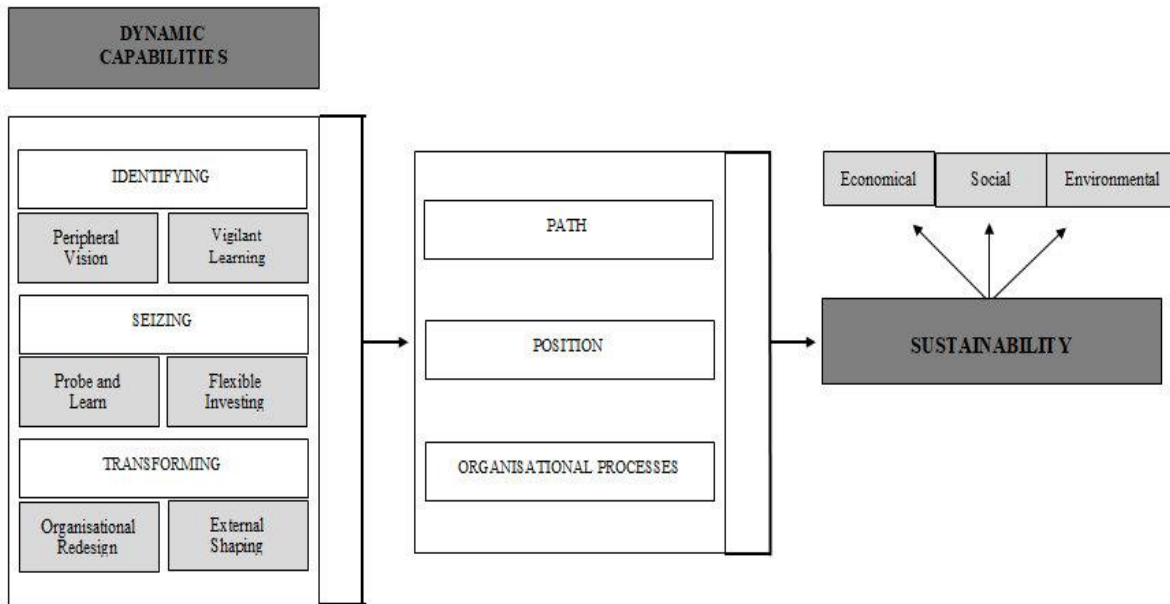


Figure 1. Suggested theoretical framework

Source: Elaborated by the authors based on Day and Schoemaker (2016), Teece (2007, 2014) and Teece et al. (1997).

The proposed theoretical model is based on the dynamic capabilities of Teece (2007, 2014) to sense, seize and transform the opportunity. They were applied in a more recent approach by Day and Schoemaker (2016), who claim that there are six sub-capacities that are easily identifiable in the organizational environment. To achieve this conceptual deepening, the operational elements of Teece, Pisano and Shuen (1997) and Teece (2014), trajectory, position and organizational processes, will be considered the link between organizational sub-capacities and sustainability, evaluated in the three pillars, economic, social and environmental.

Method

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For this exploratory research, a multiple case study was performed and it enabled the comparison of several realities by enhancing the coverage on the object studied (Yin, 2015), and the evaluation of the dynamic capabilities' contribution to promoting the company's sustainability. To this end, an interpretative approach was used, since it allows the interpretation of events in a first-order analysis by the people who go through such events (Van Maanen, 1979). In this context, the interviewees' perception becomes the analysis basis (Van Maanen, 1988). The researcher, on the other hand, takes on the role of formulating second-order interpretations in a more profound and theoretical way (Van Maanen, 1979).

The criteria for selecting the participating companies were:

(a) they must be located in the regions of Rio Grande do Sul state known as Vale do Sinos or Vale do Paranhana, since these regions are dynamic and economically relevant (they currently comprehend 24 municipalities and represent 13.6% of the state's GDP) (Corede, 2017; Consinos, 2017; Pessoa, 2017).

(b) they must be an industrial or service company, since these activities are meaningful to the region's economy. The regional distribution of Gross Value Added in industry is 28.3% and in service is 70.9% (Corede, 2017; Consinos, 2017; Pessoa, 2017).

(c) they must be a medium- or large-size company, because companies of this size are more likely to have an internal structure that is properly developed and formalised for this study. Medium-sized in industry means between 100-499 employees, and in services it means between 50-99 employees. Large size in industry means more than 500 employees and in services it means more than 100 employees (Sebrae, 2013).

(d) sustainability must be part of their strategies in order to suggest its strategic importance.

(e) they must hold at least one award or certification related to sustainability, in order to indicate the representativeness in their area and meeting sustainable issues.

For this research, a convenience sample was used. First, sites related to sustainability were visited, looking for institutions from the industrial or service areas, in order to check which companies

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meet the selection criteria. A total of 18 companies that meet these criteria were identified. The first contact was a phone call to explain the research's objective and to identify the person with more knowledge to answer the study's questions. The person responsible for the company's sector or sustainability committee was identified. Then, a standard e-mail was sent to these persons explaining the research's structure and the way each one could participate. Of the 18 companies contacted, seven showed interested to respond to the research, representing 40% of response rate. The other 11 companies were contacted twice more, however, there was no adhesion.

The interviews were conducted with these seven interviewees, one member per company. Each interview lasted an average of 50 minutes, totaling six hours of recording. Subsequently, the recordings were transcribed to a structured analytical base in the excel program, where the questions were placed horizontally and the respondents and their responses were placed vertically, enabling a better comparison of the collected data.

The data collection instrument consisted of a semi-structured interview script based on Froehlich (2014). Two blocks of questions from the script were adopted to meet the research objectives. The first block investigates sustainability in companies and the second block identifies aspects of dynamic capabilities. Based on the theoretical review carried out, the third block of the script was constructed, which contained questions to verify actions related to the subcapacities of Day and Schoemaker (2016). Then, in-depth interviews were conducted with each of the participants in the companies.

The analysis' primary data (interviews) were transcribed and tabulated. Then, the content analysis method guidelines were adopted. According to Zanella (2009), this technique demands written material from texts, interview transcriptions and other types of records. Secondary data (documents, awards and certifications) were analyzed in a complementary way, also through content analysis, to revalidate the data collected in a primary way. From that point, the relationship between the theoretical basis of dynamic capabilities and sub-capabilities (Table 2) and the elements (path, position and organizational processes) presented by Teece, Pisano and Shuen (1997) were compared, with the objective to identify the dynamic capabilities which contribute to sustainability development, as

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presented in the framework (Figure 1). Through the categories of analysis, dynamic capabilities and dynamic capabilities in sustainability, the presence of dynamic sub-capacities were identified, considering how resources or dynamic factors interact to achieve sustainability. All data collected were validated, based on the selection criteria of the company and the respondents. All research questions were responded. All data collected were validated and analyzed in the analysis, based on the estimated criteria in relation to the profile of companies and respondents.

Results

The participants have a brief description, and then data analysis is presented. In order to describe the participants, letter ‘I’ was used to identify companies from the industrial area, and letter ‘S’ was used to identify companies from the service area. In general, the five criteria listed to define the research participants were met by the seven companies analyzed.

Firm (founded)	Criteria				
	Location	Sector	Size (employees)	Sustainability Strategy	Awards
IA (2004)	Portão, RS	Leather Industry	90	Inserted in the internal handbook of action.	LWG (Leather Working Group) Golden Seal and the Brazilian Leather Certification of Sustainability (CSCB).
IB (1949)	Parobé, RS	Footwear Industry	1,000	No sustainability policy registered.	Golden Seal in the “Sustainable Source” and project awards.
IC (1955)	Igrejinha, RS	Footwear Industry	3,500	Waste Management Plan.	Silver Seal in the “Sustainable Source” program.
ID (1989)	Portão, RS	Chemical Industry	108	Internal sustainability policy.	ISO 14001.
SE (1975)	Novo Hamburgo, RS	Health Service	1,500	Sustainability and Environmental Policy.	Silver Seal of Sustainability Governance and Social Responsibility Certification.
SF (1996)	São Leopoldo, RS	Education Service	45	Inserted in the Quality Policy.	ISO 9001.
SG (1969)	Novo Hamburgo, RS	Education Service	1,500	No sustainability policy registered.	Environment-Friendly Company and Ecology Expression Award.

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* The companies' identification was kept private.

Table 3. Profile of the Research's Participating Companies

Source: Elaborated by the authors from collected data.

The interviews were performed during the second semester of 2018. Detailed information on the participating interviewees are represented on Table 4.

Firm	Position	Company Time	Academic Education
IA	Sales Manager	18 years	Graduation Degree
IB	Procurement Manager	17 years	Graduation Degree
IC	Occupational and Environmental Safety Technician	21 years	Graduation Degree
ID	Local Manager	2 years	P.H.D. Degree
SE	Environmental and Sustainability Analyst	4 years	P.H.D. Degree
SF	Higher Technician Level I	5 years	P.H.D. Degree
SG	Environmental Management Engineer	15 years	Master Degree

Table 4. Profile of the Research's Participating Interviewees

Source: Elaborated by the authors from collected data.

Sustainability Actions

The development of actions turned to the sustainability that reaches the three pillars (economical, environmental and social) is important to the companies. According to Rezaee (2018), the corporate sustainability must keep a balance between the short- and long-term continuous improvement of the financial and non-financial performance. Table 5 presents the main actions developed by the research's participating companies.

Firm	Economical Pillar	Environmental Pillar	Social Pillar
IA	Product consumption economy.	Rubbish separation; Decrease in atmospheric emission, such as the use of solvent, among others; Water reuse; Waste management.	School vegetable garden collaboration; Collect milk cartons for institutions; Collect plastic caps for the Bone Marrow Friends association (AMO); Employee training.
IB	New products release.	Waste management.	Talent factory; Announce sustainability culture internally.
IC	Materials recycling.	Water energy and material consumption control; Waste management; Cooking oil collection.	Employee-connection program; Partnerships with social institutions; Internal week of accident prevention and trainings.

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ID	Free energy market.	Alcohol refuelling; Correct waste management and disposal; Natural resources' consumption control.	Aggressive retirement plan; Breakfast to the employees; Health insurance; Collect plastic caps for charity institutions.
SE	Anti-corruption actions; Product release.	Inventory and gases neutralisation; Tree-planting actions; Waste management; Cup-and-mug sustainable kit, thus reducing cup consumption.	Blood donation campaign; Lecture on Health Education in schools.
SF	Performance Management; Suppliers' management.	Environmental impact management; Natural resources' consumption management; Cup-and-mug sustainable kit, thus reducing cup consumption.	Social-educative actions; Employee courses; Participation in the Sustainable Agenda, a cultural event focused on sustainability; sustainability hot-site; Facility accessibility; Employee's health and safety.
SG	Materials reuse; Sustainability-focused research projects.	Waste management; Recycling; Actions to minimise the use of natural resources.	Employees' benefits; Student benefit program; Cultural events turned to society; AMO plastic cap campaign.

Table 5. Sustainability actions for each pillar

Source: Elaborated by the authors from research data.

In relation to the Economic Pillar, the findings permeate conscious consumption and avoid waste of products or raw materials, evident in 5 (five) of the companies. Regarding the Environmental Pillar, there seems to be a great movement in the industries around waste management to minimize the impact of its activity on the environment. In service firms, some actions could be observed to raise awareness about natural resources and their depletion. In the Social Pillar, for 3 (three) of the companies, there is a regular participation in events and campaigns for external society. All of the firms are performing actions for the organization's internal society. Table 5 also shows that several actions are repeated in the companies, which strengthens their importance for the development of a sustainable perspective, such as internal waste management and materials reuse. From the companies researched, four of them report on sustainability in order to measure their results; the remaining companies disclose their results through a bulletin board, trainings, intranet, client's satisfaction surveys, and newsletters, among others.

In sum, all the companies state that they are developing their practises by respecting the three pillars of sustainability, especially when they develop product innovations or internal processes. This

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fact complies with the authors who claim it is necessary to understand the importance of reaching the tripod of sustainability pillars (Harris et al., 2001; Caiado et al., 2015). The interviewees claim they are aware that the internal changes and innovations need to respect the environment and society and bring positive results to the company.

Dynamic Capabilities

Based on Day and Schoemaker (2016), the research presents the analysis and the dynamic capabilities' result discussion through the six sub-capabilities (peripheral vision, vigilant learning, probe and learn, flexible investing, organizational redesign and external shaping).

Sensing - Peripheral Vision: The peripheral vision for sustainability in the companies is different. However, they depend on the operating license compelling adequacy. In the industrial companies, issues related to the environmental pillar were identified, at first, when it comes to waste management, adequate disposal and exceeding materials, among others; then, when it comes to social issues related to the employees, such as health and work safety. Next, society's issues, in general, were discussed, such as community programs and social actions.

The interviewees stated that, from the year 2000, their companies started to pinpoint actions with the objective to reach more results than what is defined by law. On this, Teece (2014) states that most of the organizational path is moulded by past legacy, but reshaping future paths and guidelines is essential. That is, constant evolution becomes of fundamental importance with the search of sustainable improvements for the internal and external environment, and the peripheral vision is vital.

The service companies also started to notice the sustainability importance in the 2000's, especially concerning the Environmental Pillar. Social actions in service firms integrated their strategies a bit earlier when compared to industrial companies, since they already worked on social practises even when they didn't see them as sustainable related.

Therefore, the sustainability's peripheral vision appears in a way that law constraints can be met, especially in the industrial sector. As presented by Company ID, "[...] especially because the leather-

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footwear industry is famous for polluting, so we have very strict rules and legislations. It means that, in order to have an operating license, you must meet high standards [...]”. However, both service and industrial companies started to think more strategically on the sustainability actions from the 2000’s, with the objective to serve the three pillars in a more integrated way.

Sensing - Vigilant Learning: About the way to explore opportunity and develop it, it is possible to see that the operation license conditions make the company’s actions consistent when it comes to sustainability’s legal matters. On the other hand, the institutions that award certificates and seals that acknowledge the sustainability of these companies were identified as important actors that encouraged the internal sustainability dynamics. According to some interviewees, the institutions that award certificates make it possible for their companies to work on the sustainability indexes more effectively, which is related to the opportunity interpretation in an exploratory and vigilant way (Day & Schoemaker, 2016).

Day and Schoemaker (2016) state that it is important to identify the members who hold knowledge and can add up to the projects. On this, the organizational processes involved with the sustainability actions in the company are presented in Table 6.

Firm	Structure of the Organizational Processes
IA	Internal committee with members from several areas and one person in charge.
IB	An internal committee by action unit that acts in an integrated way in order to work on a common goal.
IC	Internal committee of sustainability that reports to the company’s management.
ID	A specific department in the company to work on the sustainable issues in collaboration with external consultancy.
SE	A department responsible for the company’s sustainability issues and marketing.
SF	An internal committee with members from several areas under the guidance of the coordination that places guidelines and actions to be followed.
SG	A specific department of sustainability under the coordination of an engineer that works specifically on environmental issues.

Table 6. Structure of the Organizational Processes
Source: Elaborated by the authors from research data.

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On the organizational processes involved with sustainability, there are two main organization forms related to sustainability. To Pisano (2017), the definition of structure is influenced by the governance style, resources' allocation and management systems. Half of the companies established an internal committee to implement sustainability issues. This committee is usually composed of an employee from each strategic area in the company. The other half of the respondents has a specific department to work on sustainability issues. These two types of structures are different, especially when it comes to governance, and the committees are probably more effective to sustainability, since they have more representativeness and, consequently, power to allocate resources (Pisano, 2017).

Seizing - Probe and Learn: About this sub-capability, it is important to challenge the team to try small planning that can bear results for the company (Day & Schoemaker, 2016). About that, the respondents state that new ideas are important for the sustainability's constant improvement. Thus, most state they encourage the managers to think along with their teams about sustainability opportunities, whether to reduce operational costs or to search for new ways of materials' storage and disposal that are more and more sustainable. As stated by company IC: *[...] the person who doesn't take part in the committee needs to take the information to their department and, together with the employees there, start bringing alternatives in order to improve each index [...]* and *[...] the work that has been done with the reproductive reuse of the exceeding material in the process is a great example of sustainable change [...]*.

Seizing - Flexible Investing: The interviewees state that the investments in sustainability generate costs for the companies. Therefore, it is important that the actions are deeply researched in order to bring in effective profit. Company IB states that there is still *[...] lack of understanding by the consumer and the public in general. Most people still do not value the issues related to sustainability when the product is there in the store [...]*, which is related to the perception by Day and Schoemaker (2016) that there must be investments in alternative projects that will generate real deals.

On the companies' positioning for acting with a sustainable bias, they were awarded the prizes and certifications presented in Table 3. It is possible to see that all participating companies are

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recognised with awards and certifications. In this sense, it becomes visible that these companies have identified real options in order to act together with sustainability. Moreover, the interviews showed that they are proud of their awards and policies, which are displayed in the murals, at the front desk (for the visitors) and other areas in the company (for the employees), with the objective to reinforce the importance of sustainability.

Besides, in most of the companies, there are policies and instructions of work related to sustainability, and this is spread out to the employees through trainings, regular meetings and internal handbooks. These practices may enable the execution of the sub-capability visualisation of options, since it offers the members guidelines on how to act. To Teece (2014), in this sense, the position usually offers value to the company and its stakeholders, and is perceived as a differential factor that may be attractive to the client.

On the development of real options, there is some critic from the interviewees, as stated by Firm ID: “[...] as an obstacle, I see some legal matters that can hamper projects. Also, technical matters for, sometimes, we want to do something and we don’t find the resources in Brazil [...]”. That is, in some cases, the companies actually visualise their options, but lack government incentives and external partnerships to further develop these ideas.

Transforming - Organizational Redesign: For the organizational reshaping, it is important that the company notices it and benefits from its current position (Day & Schoemaker, 2016). When questioned about the company’s position as for the sustainable matters, Table 7 shows what the respondents state.

Firm	Strategic Sustainability Position
IA	Through certifications achieved, the products with a differential are introduced in the market.
IB	It is inserted in the strategic planning and aims at designing actions in order to meet the three sustainability pillars.
IC	It is inserted in the business’ mission and values, as well as in the strategic planning, especially in product development.
ID	It is inserted in the company’s values, strategies and management policy.
SE	It is inserted in the strategic planning through the objective “Increase social-environmental responsibility”.

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SF	It is inserted in the management excellence model, in the organisation's values and principles. Moreover, it is part of the Balanced Scorecard.
SG	It is inserted in the strategic planning and in the institutional development plan.

Table 7. Companies' Position

Source: Elaborated by the authors from research data.

From Table 7, it is possible to perceive that participating companies are developing the sustainable matters together with business strategies. According to the interviewees, this is not only a way of market differentiation, but also a way to balance business profitability and concern with society and the environment. Rezaee (2018) suggests that companies need to expand their mission and strategies, not only in order to profit and create value for the shareholders, but also to create value for all stakeholders.

About the current position of their companies, most interviewees state that a constant adaptation and improvement in the processes and existing products is of fundamental importance. Interviewee from company ID presents an example of organizational reshaping: “[...] we had a [huge] project and have been working with energy for two years in the free market, but we want to reduce even more, so the idea of solar energy came up [...]”. It is necessary that the ideas are constant and re-adaptable, for, as stated by company ID, even if it operates with a sustainable index, it is important to perfect it more and more, since the world is constantly changing and the executed actions also need to be volatile. This also clearly illustrates the very concept of dynamic capabilities (Teece et al., 1997).

Transforming - External Shaping: On the last sub-capability, it is important to connect to companies and people in the external environment, as well as advance when it comes to knowledge sharing (Day & Schoemaker, 2016). Less than half of the respondents claim they maintain a partnership with external consultants in order to develop their internal actions. Knowledge and new technologies sharing are constant issues in the relationship between the respondents and their suppliers, to achieve more sustainable practises. As stated by Company IB, “[...] we worked on our processes together with the suppliers by filtering raw materials that do not have any heavy metals or any matter that is harmful to human health, and we are automatically contributing to the environment [...]”.

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Discussion about Dynamic Capabilities and Sustainability

In general, the contributions of the dynamic sub-capacities in sustainability regards the peripheral vision to act strategically in sustainability. From the 2000s, with more specific actions within the economic, environmental and social pillars, this results from the legacy along with the organization's current progress (Teece, 2014). Learning in surveillance, on the other hand, is strongly influenced by external conditions, such as licenses and certifications, which made companies learn to explore opportunities. According to Pisano (2017), this is linked to the organization's governance style.

To meet the learning sub-capacity in surveillance, one must experiment to change. For the participating companies, the role of the manager as facilitator of new ideas for developing sustainable actions together with their teams, is clear. Among these actions, the importance of visualizing real opportunities was evidenced, that is, the process of evaluating actions is constant, either through a committee or by a specific area of sustainability (Day & Schoemaker, 2016).

When dealing with organizational redesign, participating companies believe that revisiting processes and redefining product concepts are the source of the business strategy. Rezaee (2018) states that it is necessary to have internalized and integrated with the company's objectives, with a perspective of multilevel profit for organization. For this, external modeling occurs, in part, through access to external consultancies or through the exchange of knowledge with suppliers.

In addition to the findings related to sub-capacities, it is notable the existence of fundamental aspects throughout the process of incorporating and maintaining sustainability in the business strategy, such as training people, self-responsibility and vision of the future. These aspects can occur at different levels, according to the segment of the organization and will be presented below. According to Company IC, it is necessary to *“train people so that, when they are away, they know important it is to minimise the negative effects and compensate them by working on the three pillars”*. It is important to develop consistent and useful routine procedures in order to act upon the construction of the learning process and the inclusion of changes (Nieves & Haller, 2014), since the employees spend most of their time in the company. Constant education is necessary to train them on sustainable organizational practises.

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Furthermore, the interviewees claim it is important to be aware, concerned with and responsible for what the company acquires, manufactures and distributes into the market. Only by being based on this internal awareness with the actions a sustainability perspective can be developed. To the authors, the concern about the progress of a sustainable environment is more and more constant without undermining the resource basis (Harris et al. 2001; Caiado et al., 2015).

Specifically in the industrial sector, characterised for holding activities that are potentially pollutant, the capability to think about the future is necessary, according to the research's participants, since what is produced today generates impacts in terms of water, energy and materials usage. Then, the planning on how to keep the company economically manageable and environmentally correct, without undermining society and people reinforces the importance to have a sustainable perspective of the future and the paths it intends to follow (Teece et al., 1997; Pisano, 2017). The interviewees enhance this view, as their companies perceived the opportunity to implement sustainable practises, due to the company's growth and their need to search for differential factor in the increasingly dynamic market.

The main obstacles during the inclusion of sustainability in its practises are identified as follows: lack of partnerships or suppliers for the development of projects, lack of recognition of the internal market for sustainable products and services, and the high investment that, oftentimes, keeps the smaller companies from taking such position. Rezaee (2018) states that there are still obstacles against investment in sustainability, since, in many cases, the administrative sector offers scarce resources for the investment in sustainability. The fact the collaborators resist to change was also noticed as an obstacle for the inclusion of sustainable matters in the routine of the companies studied. To Zahra et al. (2006), the fear to interrupt existing processes and systems restricts the change in many companies.

Finally, it is possible to note that the regular meetings to improve sustainability are held continuously in order to highlight and present points to be improved, as well as redesign action plans. According to the interviewees, research, development and benchmarking are considered strong allies to continuous improvement. This means searching for a constant progress in their operational structure (Teece, 2007). That is, constant progress, in these cases, becomes a strategic resource for companies.

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From these results, the framework presented in Figure 1 was reviewed. Observed aspects that are essential for the dynamic capabilities and that contribute to sustainability in the organizational environment were included. The revised framework is showed in Figure 2.

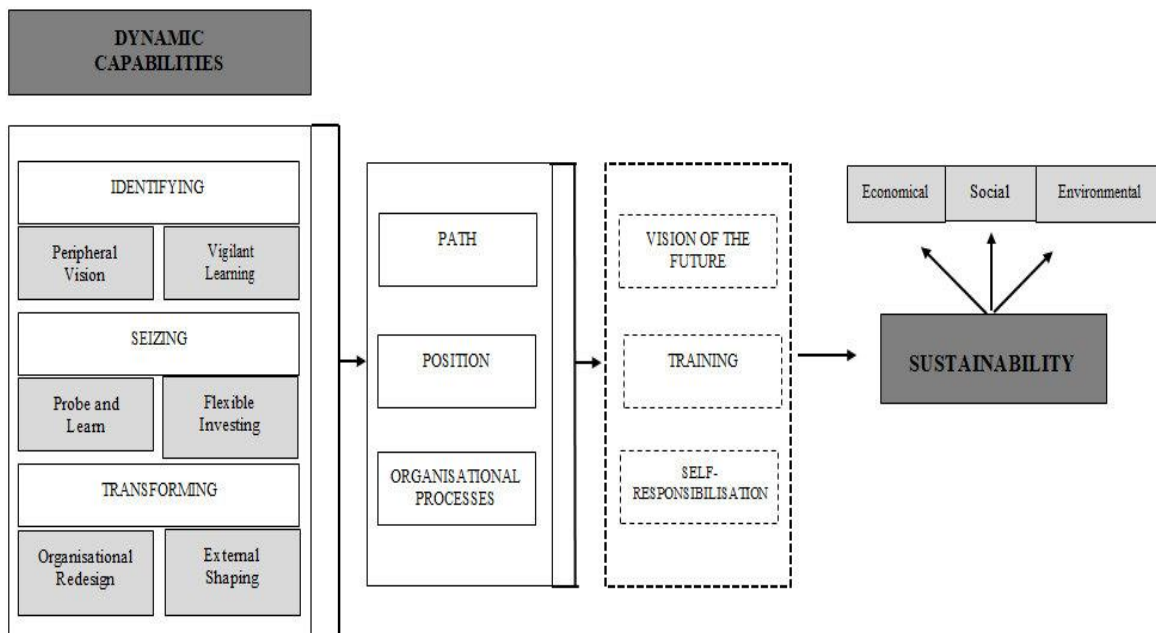


Figure 2. Research's Theoretical-Empirical Framework

Source: Elaborated by the authors from research data.

This framework, redesigned after data analysis, shows the empirical contribution of sub-capabilities to sustainability, after the results enabled the determination of aspects related to path, position and organizational processes. Therefore, the vision of the future, training and self-responsibility are characterized in an exploratory and constructive way for the process of development of sustainability.

Final Remarks

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This research's main objective was to identify the contribution of dynamic capabilities to promote sustainability in companies situated in the regions of Vale dos Sinos and Paranhana in the state of Rio Grande do Sul, Brazil. The framework used in this research, presented by Day and Schoemaker (2016), encompasses the following six sub-capabilities: peripheral vision, vigilant learning, probe and learn, flexible investing, organizational redesign and external shaping, which is based on sensing, seizing and transforming the opportunity. This study highlighted the model by Day and Schoemaker through the six sub-capabilities' segmentation linked to the operational aspects by Teece, Pisano and Shuen (1997) and Teece (2007, 2014), namely path, position and organizational processes.

The research met its objectives. At first, it checked the companies that operate under a sustainable perspective in the Vale dos Sinos and Paranhana areas, and identified 18 companies that meet the research's criteria, with 7 of them taking part in this study. Then, the study identified sustainability actions performed by these companies on all three sustainability pillars. On the economical pillar, usually a cost reduction bias was adopted. On the environmental pillar, waste management was favoured. On the social pillar, educational practises were identified with employees. The study also analysed how each sub-capability contributes to sustainability and the relationship with certain fundamental aspects, such as vision of the future, training and self-responsibility for the operation that aims at sustainability.

Generally speaking, upon analysing the dynamic sub-capabilities and how they contribute to sustainability, it was possible to see that the peripheral vision comes up similarly in the industrial and service companies through the operation of firm's license conditions. As for the vigilant learning sub-capability, it could be perceived that the institutions that promote certifications and seals that recognise the sustainable companies helped with the sustainability indexes' development. On the probe and learn and flexible investing sub-capabilities, it is important to challenge the employees to expose their ideas, as well as raise awareness on the consumer about the importance of sustainability. On organizational redesign, treasuring what has been achieved is as important as the search for continuous improvement. On the external environment, the main share of knowledge are enacted with the suppliers with the

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objective to check new raw materials and technologies that are less aggressive to the environment and society.

The study's main contributions show the relationship between the sub-capabilities with the organisation's aspects such as path, position and managerial processes with sustainability. This study corroborates what was suggested by Day and Schoemaker (2016), on the sub-capacities applied in organizational practice. The empiric data point out to three aspects not yet identified in the literature that brought an advance to the theoretical model: vision of the future, training and self-responsibility. These aspects were exploratorily and constructively characterised for the sustainability development process in the empirical context investigated. Thus, the two main contributions of this research were: a) practical application of sub-capacities and b) theoretical evolution of aspects related to the theoretical model.

The study's limitation lies on the number of participating companies. However, the research conditions the development of new researches. As a suggestion for future researches, there could be an expansion of the contacts with the companies, both industry and services, with the objective to give more information and ensuring the factors which involve sustainability. This data collection expansion could be reached through quantitative questionnaires aiming at a higher number of respondents and, consequently, apply statistical methods such as structural equation modelling and testing for the mediating effects among the main analysis dimensions as proposed here.

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