


## ANALYSIS PERFORMANCE POTENTIAL OF STARTUPS BASED ON AMBIDEXTERITY

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### ABSTRACT

Considering that ambidexterity is the capability of an organization to create, innovate and obtain new discoveries to ensure long-term sustainability, while improving internal procedures aimed at short-term operational efficiency, this research aimed to evaluate the potential that enterprises sheltered at Guamá Science and Technology Park (Belém – PA) have, to achieve a superior performance, based on their ambidextrous management characteristics. This research contributes to advances in strategies of Park's organizations and intends to inspire other enterprises with the same characteristics. Face-to-face interviews were carried out to apply a questionnaire to 19 resident managers of Guamá PCT, and the data were initially treated with descriptive statistics, followed by creation of an "Ambidexterity Index" capable of enabling the analysis of the performance potential of each enterprise. The results indicated that Guamá PCT startups have performance potential, with emphasis on the use of exploration dimension, which presented higher rates of management practices than the exploitation dimension, a fact that can be explained by the very innovation characteristic of the ventures housed in science parks. Thus, it is concluded that the Guamá-PCT ecosystem is favorable for the ambidextrous development of startups, that is, favorable to the development of the capacity to guarantee long-term sustainability, without losing sight of the need to properly manage short-term resources, and this study indicated gaps that must be observed and can be worked on through consulting and training with the sheltered organizations to enhance performance, increasing sustainability and seeking to ensure the long-term survival of these enterprises.

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## 1 INTRODUCTION

In *the startups* universe, the stimulus to innovation, together with the establishment of necessary organizational routines, market positioning and adequate result structure, can release all entrepreneurial potential and stimulate its performance, growth and fixation in the market (Balboni, Bortoluzzi, Pugliese & Tracogna, 2019). This business model that combines innovation capacity with operational efficiency we call ambidexterity.

Organizational *ambidexterity* can lead the enterprise to acquire good results from the balance between two dimensions: exploration and exploitation, where the first focuses on the activities of creation, innovation and adaptability to the environment, and the second proposes the efficiency of current processes (Gibson & Birkinshaw, 2004; Junni, Sarala, Taras & Tarba, 2013; Martins, Rossetto & Añaña, 2014; Mardi, Arief, Furinto & Kumaradjaja, 2016; Peng, Lin, Peng & Chen, 2019; Dranev, Izosimova & Meissner, 2020).

While exploration actions are associated with the ability to create, innovate, experiment, and get new discoveries (March, 1991), the exploitation process includes choice of procedures, refinement, efficiency, implementation and execution, being more related to the company's current procedures and aiming for short-term benefits with the improvement of current capabilities, products and services (Andriopoulos & Lewis, 2009; March, 1991).

In fact, the ability to act ambidextrous, enhances the entrepreneurial mindset and leads to a superior performance and in this sense the organizational ambidexterity is an element that indicates the dual orientation of an enterprise, in exploring the available opportunities and valuing resources that are often imperative for the organization survival (Aftab, Veneziani, Sarwar, & Ishaq, 2022).

In the scenario of the development of ambidextrous capacities, *startups* housed in technological parks gain prominence, because they are located in infrastructures that allow the connection with research centers of universities, in an innovative environment, with a relevant role in the economic, social and academic field (Pereira, 2019). The innovative and entrepreneurial characteristics of these organizations become useful and important for the ambidextrous techniques for operating in an environment of uncertainty and using innovation to gain their position in the market (Zica, 2016; Gurgel 2017; Severgnini, Galdamez & Vieira, 2019; Junni, Chang & Sarala, 2020). In this sense, Schreuders and Legesse (2012) point out that the small technology company must be able to innovate at a pace necessary to stay ahead of established larger companies, not falling into irrelevance to the point of being replaced in the market, in contrast, it needs to act strongly in its controls in order to maintain a good reputation, thus avoiding dissatisfaction and abandonment of current customers.

Given this context, given the relationship established between environmental management and performance, this study seeks to answer the following research problem: What is the superior performance potential of *startups* housed in the Guamá Science and Technology Park?

Therefore, the research aims to evaluate the potential that the enterprises housed in the Guamá PCT have to achieve a superior performance based on their ambidextrous management characteristics.

Data from the Ministry of Science, Technology, Innovations and Communications indicate that Brazil has 71 technological parks at various levels of maturity, 55 in operation, eight in implementation and eight in project phase, which house 1,993 organizations and generate about 43,070 jobs, contributing to the regional development of enterprises and generating new employment opportunities (MCTIC, 2022).

Thus, this study is justified by the relevance of Guamá PCT, in the regional context, the only technological park in operation in the North of Brazil, located in Belém, PA., and by the

potential contribution of this research to advances in the strategies of organizations characteristic of technological parks, especially for the benefits provided by ambidextrous performance in uncertainty environments, in which the balance and the search to simultaneously satisfy the need to innovate, while meeting the demands of existing customers and products, it is an important dilemma for small technology companies at the beginning of their life cycles (Schreuders & Legesse, 2012).

Thus, the main contributions of this study stand out: i) the national discussion about demonstration of the ambidextrous nature of *startups* and the relationship with their performance, enriching the literature on the subject, from a sample of Brazilian enterprises; ii) the disclosure of strategies of the Park organizations capable of inspiring other enterprises in the same characteristics, making the theoretical discussion more concrete and utilitarian in favor of the performance and growth of startups; and, iii) the provision to participants of a useful tool for analysis and reflection on the practices of organizations sheltered in the Park, indicating gaps that must be observed to enhance performance, generating internal policies to stimulate business consulting and training, capable of minimizing deficiencies and promoting the sustainability and long-term survival of sheltered organizations, experience that can be replicated to other Brazilian realities.

## 2 AMBIDEXTERITY AND PERFORMANCE

The organizational ambidexterity in the accounting sphere assumes that, in order to achieve organizational strategic objectives, managers need to deal with the presence of conflicting demands, which need to be balanced to ensure the success and long-term survival of the entity (March, 1991; Tushman & O'reilly, 1996). These demands are portrayed as exploration of new possibilities (innovation) and exploitation of old certainties (efficiency in processes) (March, 1991). In fact, organizational ambidexterity stands out as a strategy used to promote the balance of the organization in a changing environment, overcoming the challenges imposed and achieving superior performances (Junni *et al.*, 2013; Zica, 2016; Aftab *et al.*, 2022).

It should be noted that the concept of performance can assume different representations that will vary according to the interests, objectives and perceptions of managers, customers and the society in which an organization operates (Kaplan & Norton, 1996). Performance depends not only on the effectiveness of the internal organization for the implementation of a defined strategy, but also suffers influence from the characteristics of the business, the macroeconomic environment, the sector of activity and the strategic choices itself (Gupta & Govindarajan, 1986).

In the search for superior performance, on the one hand, *the exploration* aims at the new, experimentation, radical changes, creation, innovation and with a focus on long-term adaptations (Benner & Trushman, 2003; He & Wong, 2004; Jansen, Van Den Broesch & Volberda, 2006), and on the other hand, *the exploitation* dimension is associated with refinement, adaptability and efficiency of products or services and the reduction of uncertainties, resulting in benefits as to speed, clarity, the certainties and vicinity in the activities being developed (March, 1991, Popadiuk, 2012, Xavier, 2017).

The balance between exploration and exploitation must be maintained, organizations must prioritize practices that can maintain balance in actions that seek the development of new products/services as they improve the existing ones (Martins; Rossetto; Añaña, 2014) improving the survival capacity and competitiveness (Tushman & O'reilly, 1996; Gibson & Birkinshaw, 2004; He & Wong, 2004; Lubatkin, Simsek, Ling & Veiga, 2006; Aftab *et al.*, 2022).

By privileging one dimension to the detriment of the other, it may cause losses in organizational performance (March, 1991), the stimulus to *exploration* can compromise the efficient management of existing products and processes, may involve high costs of experimentation, many ideas to be developed and few distinctive skills (Junni *et al.*, 2013; Heavey & Simsek, 2017), while the emphasis on *exploitation* actions can inhibit the generation of new

ideas, products and processes, leading the organization to a state of equilibrium below ideal, impairing the company's survival and adaptability to the transformations of the external environment (Gibson & Birkinshaw, 2004; Lin, Yang & Demirkan, 2007, Junni *et al.*, 2013), especially in the context of the Covid-19 pandemic, in which companies had to adapt to a reality that was not foreseen (Rathakrishnan, Ng, Ho & Zawawi, 2021).

In order to capture the relationships and effects of ambidextrous on the organizations' performance, studies focused on categories, variables and differentiated indicators of performance measures (Andriopoulos & Lewis, 2009; Carmo, 2018; He & Wong, 2004; Jansen, Van Den Broesch & Volberda, 2006; Lubatkin *et al.*, 2006; Morgan & Berthon, 2008; Popadiuk, 2012; Monteiro & Vargas, 2018, Balboni *et al.*, 2019). In fact, previous studies sought to identify ambidextrous attributes capable of ensuring the performance, growth and sustainability of the enterprise in the long run.

## 2.1 Measurement of *Exploration* within the Ambidexterity Context

Given the different ways of measuring the ambidexterity proposed in the literature, in this research three categories of measurement were identified: people and organizational environment; products, services and processes; and, customers and market. Table 1 presents a compilation of variables and indicators to identify the functions *exploration* in the organizations.

The category that covers people and organizational environment highlights the training and development processes of the team and the creation of an environment that provides creativity (Andriopoulos & Lewis, 2009; Popadiuk, 2012; Carmo, 2018). Popadiuk (2012) points out that learning processes are fundamental, highlighting that fast-changing sectors, as in the case of *startups* studied in this research, require organizations to create new knowledge to remain competitive. Andriopoulos and Lewis (2009) and Carmo (2018) highlight the importance of valuing creativity (personal expression) and its influence on the inspiration of new opportunities, especially in environments focused on research and development.

Table 1

### Variables and indicators of exploration measurement grouped by authors and categories

Authors	Measurement of Exploration by Authors and Categories		
	People and Organizational Environment	Products, Services and Processes	Customers and Market
Benner and Trushman (2003); He and Wong (2004); Jansen, Van Den Broesch and Volberda (2006); Lubatkin <i>et al.</i> (2006); Morgan and Berthon (2008); Gurgel (2017)		It seeks new technological ideas; creation and introduction of new products and services.	Perception of new opportunities; seeks strategies for opening new market segments and new customer groups.
Andriopoulos and Lewis (2009)	Personal expression, challenges and pride motivate employees' creativity.	Take risks to ensure long-term adaptability.	Use of new technologies leverage new opportunities.
Popadiuk (2012)	Training of the team. Intensity of people's development.	Focus on totally new products and processes.	Constant search for new markets.
Carmo (2018)	Encouraging new ways of doing things and creating an environment conducive to creativity.		Development of innovation initiatives in conjunction with other companies or institutions.

Source: Elaborated by the Authors, 2021.

In the Process, Products and Services category, the exploration dimension focuses on identifying the search for new products/services and new opportunities (He & Wong, 2004; Jansen, Van Den Broesch & Volberda, 2006; Popadiuk, 2012). Lubatkin *et al.*, (2006), proposes the search for new technological strategies and the promotion of innovation. In addition, *the exploration* actions are focused on experimentation research and development, with the search for long-term returns (Andriopoulos & Lewis, 2009), thus worrying about the prosperity and longevity of the business. In a complementary way, Carmo (2018) points out that the emphasis on experimentation results in a risk-resilient organization, tolerant to the failure caused by the experimentation of new ideas.

In the category customers and markets, attention is focused on reaching external factors the organization: the reach of new markets (He & Wong, 2004; Jansen, Van Den Broesch & Volberda, 2006; Lubatkin *et al.*, 2006; Popadiuk, 2012) or the implementation of new techniques in current markets (Morgan & Berthon, 2008) and also the importance of building partnerships with several institutions that promote the emergence of innovation (Carmo, 2018), as seen in the Guamá Science and Technology Park.

## 2.2 Measurement of *Exploitation* within the Ambidexterity Context

Considering the same measurement categories already defined: people and organizational environment; products, services and processes; and, customers and market, Table 2 presents the variables and indicators for identification and measurement of *exploitation* function in organizations.

Table 2

### Variables and indicators of exploitation measurement grouped by authors and categories

Authors	Measurement of Exploitation by Authors and Categories		
	People and Organizational Environment	Products, Services and Processes	Customers and Market
He and Wong (2004); Jansen, Van Den Broesch and Volberda (2006); Lubatkin <i>et al.</i> (2006); Morgan and Berthon (2008)		Refinement and adaptations of existing products and services; process improvements, product quality and cost reduction.	Expansion of services and improvement of existing products and services; monitoring of customer satisfaction.
Andriopoulos and Lewis (2009)	Explicitly defined roles.	Careful allocation of resources privileging efficiency.	Search for stable revenues through recurring clients; observation needs market.
Popadiuk (2012); Serviginini (2016); Carmo (2018)	Creation of detailed routines and tasks monitoring.	Standardization; focus on costs; operational efficiency.	
Monteiro and Vargas (2018)	Employees' training.	Procedures for standardization of operational processes.	

Source: Elaborated by the Authors, 2021.

Regarding the category people, Andriopoulos and Lewis (2009) bring the importance of assigning explicit functions as a way to enable the employees' focus.

They complement that there is a need of a person who organizes this area, able to delegate things well and attract the people involved. Monteiro and Vargas (2018), in turn, point that training when linked to *exploitation* activity, is essential to maintain a level of standardization, highlighting the relevance of organizations to promote the training of new employees and recycling of the old ones.



In relation to the category products, services and processes, Table 2 shows the recurrence of authors who mention cost reduction as a characteristic of *the* exploitation dimension, arguing about the importance of focusing on the gradual reduction of productive costs, associated with the improvement of the organization internal processes (Lubatkin *et al.*, 2006; Morgan & Berthon, 2008; Jansen, Van Den Brosch & Volberda, 2006; Popaudik, 2012). Still in relation to processes (2018) Carmo argues about the importance of standardization of operations, as a way to achieve scalability and maximize profit. Whereas Monteiro and Vargas (2018) defend standardization as a way of preserving the brand, integrity and value. Popadiuk (2012), in turn, mentions the creation of detailed routines, structured in reports, in order to replicate the knowledge of existing practices in the organization. Severgnini (2016) defends the monitoring of indicators with the aim of monitoring the performance of a product, service or process as a way to improve operational efficiency

From the perspective of the category customers and markets, the need for careful observation of customer demands is highlighted, maintaining stable revenues through satisfied recurring customers, whose demands are perceived and existing products are constantly monitored and improved (Jansen, Van Den Bosch & Volberda, 2006; Lubatkin *et al.*, 2006; Morgan & Berthon, 2008, Andriopoulos & Lewis, 2009).

Finally, when analyzed the category people and organizational environment, it is noteworthy that the training and clear definition of employees' functions lead to the correct execution of processes, which ultimately impacts on the quality of the products and services offered and on the customers' satisfaction (Andriopoulos & Lewis, 2009; Monteiro & Vargas, 2018). Popadiuk (2012) emphasizes the adoption of strategies related to the short term, considering that when implemented effectively, incremental changes are crucial to the success in the short run of the organization, in this sense Balboni *et al.* (2019) concluded that the balance of the dimensions of the ambidexterity presented in a different way when analyzed from the perspective of the enterprise's life cycle, with a greater focus on innovation in the early stages, evolving to a better balance in the following stages, in order to ensure performance and growth.

It is observed how much ambidextrous management is able to contribute to the success and survival of organizations, because it allows the development of new resources and capabilities (*exploration*), while ensuring innovations are integrated with current resources and capabilities (*exploitation*). However, it is recognized that such performance benefits can be difficult to achieve due to challenges related to ambidextrous projects, such as managing different teams and mentalities and implementing different leadership styles in the search for ambidextrous standards (Schreuders & Legesse, 2012; Junni, Chang & Sarala, 2020).

### 3 METHODOLOGY

This study has a descriptive nature, and it was carried out through the face-to-face application of a questionnaire with structured questions to managers, owners or managers of *startups* housed in the Guamá PCT, with questions that address the constructs of exploitation and exploration, identified in the literature, summarized and presented in Tables 1 and 2.

From a population of 34 enterprises, at the end of the period between July and September 2021, 19 valid questionnaires were obtained, 14 companies and 5 research laboratories.

The questionnaire was structured with two blocks of questions, the first aimed to raise information about the organizations and their managers and the second block with closed questions type Likert, ranging from: (1) I totally disagree up to (5) I fully agree.

From the theoretical construction, a set of nine elements distributed in the three categories defined for each dimension were used to measure the level of organizational ambidexterity and the *exploration* variables are presented in Table 3.

Table 3  
**Elements that identify the *exploration* actions**

Categories	Elements that identify the <i>exploration</i> actions
People and Organizational Environment	Training of the team and Intensity of the people's development
	Personal expression, challenges and pride motivate employees' creativity.
Products, Services and Processes	Creation of new products and services
	Search for new technological ideas by thinking "outside the box"
	Development of totally new processes
Customers and Market	Opening of new markets
	Active vision for new customers groups
	Development of innovation initiatives in conjunction with other companies or institutions.
	Take risks to ensure long-term adaptability.

Source: Elaborated by the authors, 2021.

It should be noted that, from the theoretical elements presented in Tables 3 and 4, the 18 questions in Likert format that composed the research instrument were structured.

In the sequence, Table 4 presents the set of elements that denote the attitudes of *exploitation*.

Table 4  
**Elements that identify the *exploitation* actions**

Category	Elements that identify the <i>exploitation</i> actions
People and Organizational Environment	Employees' training.
	Discipline: explicitly defined roles.
Products, Services and Processes	Improves the quality of existing products/services
	Standardization of processes and creation of detailed routines
	Costs reduction
	Monitoring tasks as a way to improve operational efficiency
Customers and Market	Expansion of services for existing customers
	Development of products or services offerings, carefully observing the characteristics of their current customers
	Strategies related to the short term

Source: Elaborated by the authors, 2021.

For the treatment of the data obtained, *Microsoft Excel software* was used. The data were initially dealt with descriptive statistics. Following the study of Soares, Reis, Cunha & Steiner Neto (2018) and Soares, Mendes & Cartens (2020), to group the organizations according to their level of ambidexterity to obtain the performance potential, the Ambidexterity Index of each enterprise was calculated, based on the combination of *exploration* and *exploitation* dimensions, based on the scale presented in Table 5.

Table 5  
**Basis for the calculation of the ambidexterity index**

Assertive	<i>I totally disagree</i>	<i>I partially disagree</i>	<i>I do not disagree or agree</i>	<i>I partially agree</i>	<i>I totally agree</i>
<i>a. Absolute Value</i>	1	2	3	4	5
<i>b. Number of questions</i>	9	9	9	9	9
<i>Score (a * b)</i>	<b>9</b>	<b>18</b>	<b>27</b>	<b>36</b>	<b>45</b>

Source: Supported in Soares *et al.* (2018) and Soares *et al.* (2020).

In possession of the scale for calculation of the Index, it can be stated that the entity with the lowest index would take 9 points, while the entity with the highest index would be 45 points, obtaining intermediate scores in that the managers attribute different weights between the minimum and the maximum. Being 45 points the maximum points to be obtained in each dimension, normalized to 100%, as well as all other scores obtained.

In possession of the Ambidexterity Index, it was possible to classify each *startup* in order to evaluate the potential for superior performance, inserting the scores of each enterprise into a matrix elaborated to favor visualization. The analysis criteria are presented in Table 6.

In the light of the literature studied, Table 6 shows that the configuration of ambidexterity occurs when there is a balance between *the dimensions exploration* and *exploitation*, that is, it is not enough that only one of the dimensions presents a high degree, but they both reach balanced levels, so as to increase the organization's performance potential.

Thus, it is conditioned that, when *the level of exploration* and *exploitation* (jointly) is lower than or equal to 25%, there is the absence of ambidexterity, therefore a low potential of superior performance. For a degree of *exploration* and *exploitation* greater than 25% and lower than or equal to 50%, there is incipience of ambidexterity, still implying a low potential of superior performance.

Table 6

**Classification of the superior performance potential according to the Ambidexterity Index**

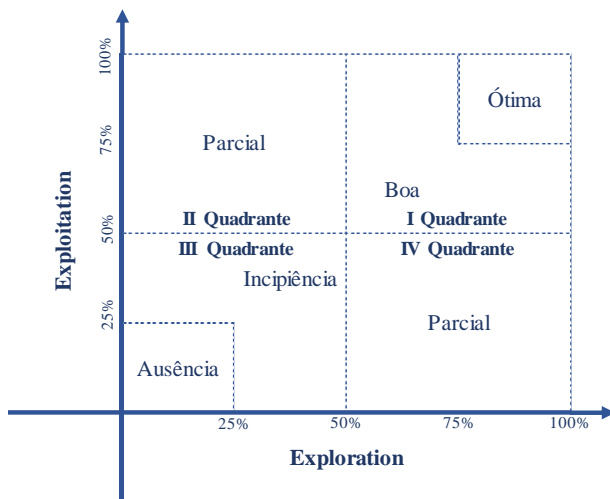
Ambidexterity Level	Exploration Level	Exploitation Level	Position in the Matrix
Absence	≤ 25%	≤ 25%	Quadrant III
Incipience	> 25% AND ≤ 50%	> 25% AND ≤ 50%	Quadrant III
Partial (exploration)	≤ 50%	> 50%	Quadrant II
Partial (exploitation)	> 50%	≤ 50%	Quadrant IV
Good ( <i>exploration</i> )	> 50% AND ≤ 75%	> 75%	Quadrant I
Good ( <i>exploitation</i> )	> 50%	> 50% AND ≤ 75%	Quadrant I
Great	> 75%	> 75%	Quadrant I

Source: Elaborated by the authors, 2021.

When an *exploration* of lower than or equal to 50% and *exploitation* greater or equal 50%, and vice versa, it has a partial ambidexterity, resulting in an unbalanced performance potential.

Then, for an *exploration* level greater than 50% and less than or equal 75%, while the exploitation degree is greater than 75%, and vice versa, there is a good level of ambidexterity, representing a high performance potential. Thus, the organization that has an *exploration* and *exploitation* of over 75%, manifests a great ambidexterity and a high potential for superior performance. Finally, the last stage of data treatment consisted of the construction of a matrix containing four quadrants, as the model presented in Figure 1.





**Figure 1.** Quadrants of superior performance potential

Source: Elaborated by the authors, 2021.

The matrix quadrants reflect the results compiled in Table 6. Summarizing the classifications of the performance potential mentioned earlier we have:

- **Low higher performance potential** (III Quadrante): both dimensions of ambidexterity need to be improved;
- **Superior unbalanced performance potential** (Quadrant II and IV): both dimensions of ambidexterity need to be improved;
- **High Performance Potential** (I Quadrante): both dimensions of ambidexterity have a good or optimal level of implementation.

## 4 PRESENTATION AND ANALYSIS OF RESULTS

### 4.1 Predominant Profile of the Research participants

Figure 2 shows the information about the respondents' profile.



**Figure 2.** Infographic of the respondents' profile

Source: Elaborated by the authors, 2021.

The predominant profile is of young men up to 46 years old, post-graduates, managers of their business, with experience over eight years in the field of activity. About organizations, the predominant profile is small companies with up to 10 employees, average time of existence of up to 10 years, but relatively new in the Guamá Science and Technology Park.

#### 4.2 Analysis of the *Exploration* Index

Initially the results of the category “People and Organizational Environment” indicate that organizations promote the training of their employees and seek for an environment conducive to creativity. Training and encouraging innovation allow the achievement of superior performances, contribute to the emergence of new ideas, products, services and processes in the organization (Davenport, 1999; Popadiuk, 2012; O’reilly & Tushman, 2004). In fact, the R&D environment, characteristic of technological parks, requires creativity for the good work performance.

In relation to the results obtained in the category “Products, Services and Processes”, the categories that presented the highest levels of exploration were the search for the portfolio expansion of products and services and the search for new technological ideas outside their own limits. For Andriopoulos and Lewis (2009) the innovative emphasis allows the organization to improve its reputation and adaptability, observing that insertions of new products or new ideas are accompanied by uncertainties due to the acceptance or not of customers.

We also highlight the long-term vision, in alignment with the studies of He and Wong (2004), in which the returns associated with exploration activities have greater concentration in the long run, subject to the success and failure of experimentation. The development of new processes to adapt market changes was perceived at a slower pace, drawing attention, given the importance of adopting innovations to serve emerging markets (Jansen, Van Den Broesch & Volberda, 2006). Among the adoption of new processes the one that was the most present among the organizations resident in the Guamá-PCT was the use of remote work practices, since the COVID-19 pandemic impacted the organizational relationships and the residents’ routine.

Finally, still in *the exploration* dimension, the data of the category “Customers and Market” showed greater potential for improvement. The PCT Guamá *startups* are taking advantage of new markets or new niches, in alignment with Gurgel (2017). The entrepreneurs also showed concern about meeting the preferences of customers in line with the ideas of Lubatkin *et al.* (2006). The third item of analysis in this category is the ability to develop partnerships. Among the partnerships identified in the organizations, it stood out with higher education institutions, and the observation that part of the employees of *the startups* participating in the research have some link with universities, another characteristic element of technological parks. However, this was one of the elements of analysis that proved to be less influential, revealing a certain contradiction with the context in which they are inserted, since Technological Parks act strongly as instruments for promoting innovation and economic development of their regions, providing an environment for joint work for common objectives (Pereira, 2019).

Figure 3 shows the average index of each assertion that makes up *the exploration* dimension of organizations resident in the Guamá Science and Technology Park, which was very positive with the evidence of results greater than 70%, with an average index of 82%, which, in principle, was what would place the enterprises in the category of high potential of superior performance.



**Figure 3.** Indices of development of practices of *the exploration* dimension

Source: Research data , 2021.

Thus, the achievement of high results in *the exploration* dimension can be justified by the proximity of an environment in which the objective is precisely the propagation of innovation, in this case the Guamá-PCT itself. These findings are consistent with the literature studied, and Balboni et al. (2019) emphasize the importance of *startups* to focus on innovation, especially at the beginning of operations, developing products and opening new markets. After this initial phase, the organization must develop the efficiency of processes (exploitation) in order to consolidate its position in the market, thus ensuring better performance and sustained growth of operations (Balboni et al., 2019).

### 4.3 Analysis of the *Exploitation* Index

Initially, on the category “People and Organizational Environment” of the *exploitation* construct, it was verified the existence of training for employees on existing practices of the organization, in the same way that they showed concern with the definition of the roles of each employee. It is noteworthy that the managers informed, in most of the interviews, that the functions are passed directly by the superiors, there is no document formalization, in this case, going in the opposite direction of the observations of Monteiro and Vargas (2018), but still, opening an important space for the creation of detailed routines capable of allowing the standardization and monitoring of tasks aiming at operational efficiency, as proposed in the literature (Popadiuk, 2012; Serviginini, 2016; Carmo, 2018).

In relation to the results of the “Products, Services and Processes” category of the *exploitation* construct, *the startups* participating in the research stated that they seek the improvement of their products and services, in alignment with the literature (He & Wong, 2004; Lubatkin *et al.*, 2006). To a lesser extent, they also stated that they gradually improve and standardize their internal routines and processes, with the potential to provide the repercussion of practices that demonstrate good results (Monteiro & Vargas, 2018).

However, the gradual reduction of costs was a low-adherence item among the participants of the research, which justified that it is not always possible to reduce costs, given the negative impact it can cause on the quality of the product or the provision of services, for working predominantly with intellectual capital. Considering the criticality of this element of *exploitation*, widely disseminated in the literature (Lubatkin *et al.*, 2006; Popadiuk, 2012; Serviginini, 2016; Carmo, 2018), it can be said that residents of the Guamá PCT technology park should use their creative capacity to obtain cost reduction in their products and services. In addition, the interviewees affirm that they perform the monitoring of tasks in the organization, and part of the

managers affirmed the use of integrated software to improve controls, aiming at minimizing errors, quality control and increased productivity.

Finally, in relation to the category “Customers and Market”, few managers indicated having an instrument and/or a relationship policy defined to accompany customer satisfaction, point that draws attention, since this is a critical factor that can lead to the organizations failure (Zica, 2016; Gurgel, 2017). On the other hand, entrepreneurs declared that they develop offers of products and services observing the characteristics and demands of their customers, in a certain contradiction with the previous question, considering that they do not have mechanisms that capture in a structured way the variations in the customers’ demands.

Figure 4 shows the average index of each assertion that makes up *the exploitation* dimension of organizations resident in the Guamá PCT, which exhibited indices lower than the dimension exploration, positive though, with an average index of 76%, which, in principle would place the enterprises in the category of high potential of superior performance.



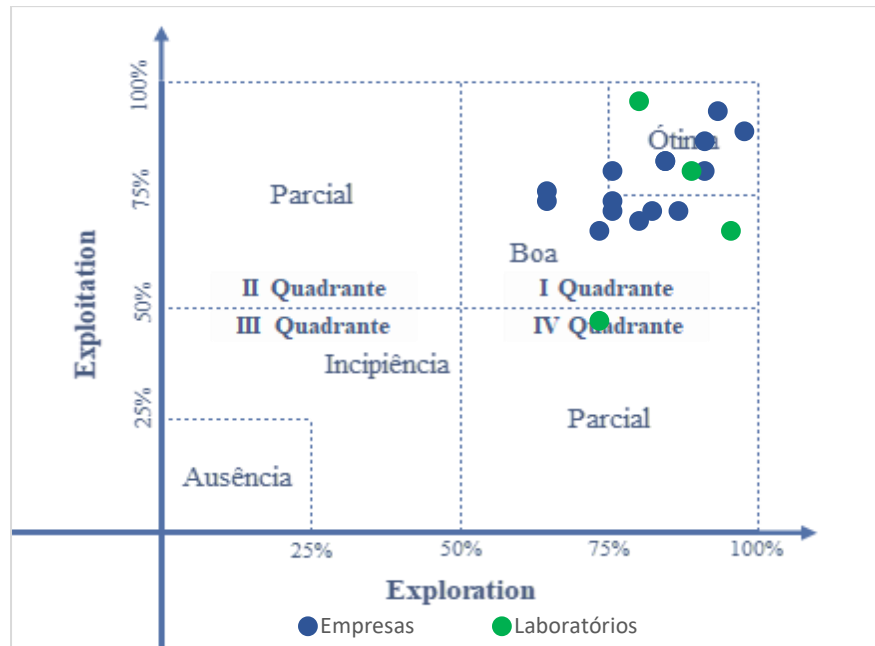
**Figure 4.** Development indices of exploitation dimension practices

Source: Research data, 2021.

In the context of the exploitation dimension, Schreuders & Legesse (2012) note that in order to survive and grow, the small technology company needs to strike a balance between satisfying existing customers and developing new products, with successive improvements in efficiency.

#### 4.4 Ambidexterity Index per Organization

Figure 5 shows the ambidextrous positioning of each of the 19 organizations evaluated in the research.



**Figure 5.** Ambidexterity level of organizations housed in the Guamá PCT

Source: Research data, 2021.

Most organizations are concentrated in the Quadrant I of the figure, presenting a good or optimal level of *exploration* and *exploitation*, thus configuring the organizational ambidexterity, revealing as a result a high performance potential of the participating organizations.

The results showed that nine of the participating organizations presented ambidexterity at a “optimal” level, while the other nine demonstrated ambidexterity at a “good” level, and only one organization (laboratory) demonstrated partial ambidexterity, with a level of less than 50% of exploitation practices, with the need for improvements in operational controls.

Analyzing the exploitation construct alone, it was noticed that 10 enterprises obtained an optimal level, while eight enterprises obtained a good level. Regarding *the exploration* dimension, 15 organizations reached an optimal level, while only four presented a good level.

During the interviews, the managers reported that the Guamá PCT offers a favorable ecosystem for ambidextrous management practices, since in its portfolio it offers consultancies, monitoring and continuous management training to residents, as well as promoting events to encourage innovation, promote and support participation in funding notices for innovation. All these actions strengthen the entrepreneurial development of *startups* and help strengthen the business in the long run.

## 5 FINAL CONSIDERATIONS

This study aimed to evaluate the potential that the enterprises housed in the Science and Technology Park (Guamá PCT, in Belém – PA) have to achieve a superior performance, based on their ambidextrous management characteristics.

Through a descriptive research, it was found, from the methodological design, that the interviewed organizations presented in their majority, a good or optimal level of ambidexterity, and only one of the organizations showed partial ambidexterity. Thus, given the theoretical survey, it is inferred that the interviewed organizations tend to have a high organizational performance, due to the simultaneous use of innovative practices and actions aimed at operational efficiency.

It should be noted that, although balance was found in the use of the *exploration* and *exploitation* dimensions, it was revealed the need for improvements in *exploitation* practices in relation to customer follow-up and service and reduction of operational costs and in *the exploration* dimension, in the strengthening of institutional partnerships.



Thus, it is concluded that the Guamá-PCT ecosystem is favorable for the ambidextrous development of startups, and this study indicated gaps that must be observed and can be worked on through consulting and training with the sheltered organizations to enhance performance, increasing sustainability and seeking to ensure the long-term survival of these enterprises.

Thus, it can be highlighted as effective contributions of this research: 1) the contribution to the literature on the subject, enriched by Brazilian empirical results; 2) practical contributions for reflection by enterprises, in order to establish development milestones, especially aimed at improving operational efficiency; 3) contribution to the dissemination of the Guamá Science and Technology Park, as a vehicle to promote entrepreneurship and innovation in the Northern region of Brazil.

As limitations of the study it is pointed out the method itself, in which interviews were conducted with managers, who, having differentiated views on the activities of the enterprise, may have generated biases in the answers, lacking triangulation of the information obtained with other sources, such as documents and *in loco* systematic observations. However, given the natural environment of the applied social sciences, we believe that these limitations do not compromise the contributions of this research.

For future research, it is suggested to expand the research in a qualitative and longitudinal environment, in order to accompany the organizations installed in this environment during their life cycle, generating more data and analysis that may be useful for the enterprises themselves and extrapolated to other enterprises located in the other Brazilian technological parks, stimulating comparative analysis, partnerships and exchange of knowledge in management, in favor of the development, innovation and development of *startups* in Brazil.

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