

**Internationalization Barriers Faced by Incubated Companies: A Study in the City
of Natal/RN – Brazil**

**Barreiras de internacionalização enfrentadas por empresas incubadas: um estudo
na cidade de Natal/RN – Brasil**

**Barreras de internacionalización que enfrentan las empresas incubadas: un
estudio en la ciudad de Natal / RN – Brasil**

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Abstract

Due to the current global competitiveness, there is a constant need for companies to find alternatives to internationalize their business models as a strategy not only of expansion, but also survival. This reality is imperative not exclusively to large corporations, but also to small and medium enterprises that can no longer rely on their local market neither have the competitive advantages of large scale organizations, thus being prone to encounter several barriers throughout the internationalization process. Business incubators have a seminal role in the internationalization process of incubated companies, offering to entrepreneurs the tools, know-how and facilities for international

development and expansion. This article endeavours to identify, from the local entrepreneurs' perspective, the barriers to the process of internationalization of the companies incubated in the city of Natal/RN. The research was exploratory and descriptive, focusing on the analysis of qualitative and quantitative variables. In total, 22 businesses across three incubators were analysed, as a result of that, it was possible to define the nature of the most pressing barriers faced by local entrepreneurs vis-à-vis the internationalization process into two groups: (1) External barriers increased by entrepreneurs' and incubators' technical limitations and (2) Strategic management barriers associated with poor networking and lack of an international expansion planning.

Keywords: Internationalization; Barriers to Internationalization; Business Incubators.

Resumo

Devido à atual competitividade global, é constante a necessidade das empresas encontrarem alternativas para internacionalizar seus modelos de negócios como estratégia não só de crescimento, mas também de sobrevivência. Esta realidade é imperativa para organizações de todos os portes, mas especialmente para as pequenas e médias empresas que já não podem contar com o seu mercado local nem têm as vantagens competitivas tradicionais das organizações de grande escala, estando sujeitas a encontrar várias barreiras ao longo do processo de internacionalização. As incubadoras, por sua vez, têm um papel fundamental no processo de internacionalização das empresas incubadas, oferecendo aos empresários as ferramentas, know-how e estrutura para o seu desenvolvimento e expansão internacional. Este artigo busca identificar, na perspectiva dos empresários locais, as barreiras ao processo de internacionalização das empresas incubadas na cidade de Natal/RN. A pesquisa foi exploratória e descritiva, com foco na análise de variáveis qualitativas e quantitativas. No total, foram analisados 22 empresas em três incubadoras, com isso foi possível definir a natureza das barreiras mais prementes que os empresários locais enfrentam no processo de internacionalização em dois grupos: (1) Barreiras externas agravadas por limitações técnicas de empreendedores e incubadoras e (2) Barreiras de gestão estratégica, associadas a redes deficientes e falta de um planejamento de expansão internacional.

Palavras-chave: Internacionalização; Barreiras à Internacionalização; Incubadoras de empresas.

Resumen

Debido a la competitividad global actual, existe una necesidad constante de que las empresas encuentren alternativas para internacionalizar sus modelos de negocio como estrategia no solo para el crecimiento, sino también para la supervivencia. Esta realidad es imperativa para las organizaciones de todos los tamaños, pero especialmente para las pequeñas y medianas empresas que ya no pueden depender de su mercado local ni cuentan con las tradicionales ventajas competitivas de las organizaciones de gran escala, estando sujetas a encontrar diversas barreras a lo largo del proceso de internacionalización. Las incubadoras, a su vez, juegan un papel fundamental en el proceso de internacionalización de las empresas incubadas, ofreciendo a los emprendedores las herramientas, el saber hacer y la estructura para su desarrollo y expansión internacional. Este artículo busca identificar, desde la perspectiva de los emprendedores locales, las barreras al proceso de internacionalización de empresas incubadas en la ciudad de Natal / RN. La investigación fue exploratoria y descriptiva, enfocándose en el análisis de variables cualitativas y cuantitativas. En total, se analizaron 22 empresas en tres incubadoras, por lo que se pudo definir la naturaleza de las barreras más apremiantes que enfrentan los emprendedores locales en el proceso de internacionalización en dos grupos: (1) Barreras externas agravadas por limitaciones técnicas de emprendedores e incubadoras y (2) Barreras de gestión estratégica, asociadas a redes deficientes y falta de planificación de expansión internacional.

Palabras clave: Internacionalización; Barreras a la internacionalización; Incubadoras de empresas.

Introduction

The present article endeavours to identify, through the local entrepreneurs' perspective, the barriers to the process of internationalization of incubated companies in the city of Natal, the Capital and largest city of the state of Rio Grande do Norte,

located in Northeastern Brazil.

The city has an estimated population of almost 900.000 inhabitants. The GDP for the city in 2015 was slightly over R\$20 Billion Reais (\$5.4 Billion USD), the per capita income for the city was R\$24,029.17 Reais (\$6,217.55 USD) and the HDI 0.763. SMEs contribution to the city economy is considerable, as around 95% of all registered businesses both in the State as in the City of Natal are SMEs, with half of that figure in the tertiary sector (IBGE, 2015; SEBRAE, 2015).

Currently in Brazil there are about 370 active business incubators, encompassing over 2300 companies. In the city of Natal/RN, there are eight registered business incubators in operation since March 2018 (COSTA, 2020).

Throughout the study, the authors followed the assumption that there is a constant need for companies and entrepreneurs to seek internationalization as a strategy not only of expansion, but also survival, accessing the impact of business incubators in that process and considering internationalization as a key aspect of innovation management (COSTA et al, 2021; COSTA et al, 2019).

Hence, in order to support the internationalization of incubated companies and contribute to their competitive advantages, it is necessary to understand the barriers along the process, as the main problems that need the attention from entrepreneurs and incubators alike will be located there (COSTA et al, 2021; ELGENMAN; ZEN; FRACASSO, 2015; ANDERSSON et al., 2013).

The research was undertaken between the years of 2017 and 2018 and sought to compare the entrepreneurs' perspective vis-à-vis the current academic research on the internationalization barriers, thus apprehending the local reality of incubated companies within a larger context of internationalization, as to understand their strengths and weaknesses, the challenges to be faced and the role of business incubators in the process.

Its main objective was to identify, from the perspective of local entrepreneurs, the barriers to the internationalization process of companies incubated in Natal / RN.

Literature Review

The conceptualization of internationalization, a priori, is a rather simple and literal task; as it can be understood as the process of increasing the involvement of organizations in international activities (JOHANSON; VAHLNE, 1977; CAMISON; VILLAR-LOPEZ, 2010) in order to increase the competitive advantages of the company, improve networking, maximize profits, reduce costs, mitigate risks and diversity intellectual capital (CAMISON; VILLAR-LOPEZ, 2010; MEJRI; UNEMOTO, 2010).

On studying internationalization, the first step is to apprehend its driving forces, which are usually divided into internal and external elements. It is also necessary to understand the interrelation of these forces and how they are affected by networking between individuals and organizations (COSTA et al, 2019).

Networking is such a key element in the whole process that it can be understood as its own category of driving force – exerting external and internal influence, as it has many different strands, encompassing corporate leadership and their orientation towards internationalization as well as the knowledge about international stakeholders and the interrelationships with customers, competitors, suppliers, government and society in general (BELL; MCNAUGHTON, 2000; BELL et al., 2003; BELL et al., 2007; SENIK et al., 2014).

There is an abundance of theories that seek to explain the phenomenon of internationalization from different angles, taking into account different origins, approaches and consequences. Table 1 summarizes the most common approaches to analyse internationalization.

Table 1 – Main Schools of Thought in Internationalization

Approach/ School of Thought	Mains characteristics
Uppsala Model	<ul style="list-style-type: none"> • Gradual and incremental developments. • Domestic experience precedes international growth. • Cultural proximities are fundamental for the consecution of internationalization. • Focused on large organizations.
Operational Approach	<ul style="list-style-type: none"> • Focuses on the growing involvement of international operations from local to international markets or from international to local markets. • Not restricted to commercial relations, but rather operational interactions. • Focused on medium and large organizations mainly.
F.D.I Approach	<ul style="list-style-type: none"> • Focuses on the growth of direct and indirect foreign investment in international transactions. • Related to larger organizations, but may apply also to SMEs.

Resource Approach	<ul style="list-style-type: none"> • Internationalization is seen as a competence created by accumulated intangible resources. • Makes no distinction of organizational size.
Network Approach	<ul style="list-style-type: none"> • Extension, penetration and integration of interconnections amongst stakeholders are the key element of internationalization. • Efficient networking may overcome time limitations and accelerate internationalization. • Tangible and intangible resources can be incremented by efficient networking. • Makes no distinction of organizational size, many approaches favour SMEs.
Born Global Organizations	<ul style="list-style-type: none"> • Significant changes on internal and external forces have been increasingly diverting companies from the gradual model of internationalization. • Internationalization may occur in less than 5 years, in some circumstances at the very inception of the company. • Companies with advanced networking and multiple channels of marketing and sales. • Focused mainly on SMEs - associated with firms with less than 200 employees and annual sales up to US\$ 100 million.

Source: COSTA et al, 2019.

The barriers to internationalization, especially for SMEs, have certainly been considerably reduced thanks to the driving forces behind internationalization and the advent of born global organizations, nonetheless, they remain complex and to many companies, unsurmountable (NARAYANAN, 2015; ANDERSSON; EVERS, 2015; ANDERSON et al., 2013). The barriers may be internal – usually related to resources and managerial practice – and external –mainly market related barriers out of the entrepreneurs’ sphere of influence (COSTA, 2020; SEKLIUCKIEN, 2013; OJASALO; OJASALO, 2011).

It is important to emphasize that networking is an essential element to overcome most of the abovementioned barriers, and networking deficiency, on the other hand, is a diffusive and increasing factor, making the barriers even more daunting, as a poor international networking results in, amongst other things, low international recognition and restrictive benchmarking, isolating companies in their internal markets and leaving them vulnerable to global competition (AGOSTINHO et al., 2015; D’ANGELO et al., 2013; SCHWEIZER).

Despite the fact that SMEs can respond more promptly to environmental changes due to their flexible decision making structure and natural propensity towards networking, they are not free from most of the internationalization barriers, having particular problems with human and financial resources. Thus, size may be a barrier or a

driving force to internationalization depending on the angle from which the phenomenon is studied (TOULOVA, VOTOUPALOVA; KUBICKOVA, 2015).

Business incubators are resource-sharing structures – space, knowledge, monitoring and technical support – that foster the creation and development of entrepreneurial activities. Its *raison d'être* lies in the control and support that takes place during incubation periods, in order to facilitate the process of consolidation of the companies in the market. Incubators are an environment of flexibility and encouragement, which gives the entrepreneur a series of tools and facilities for the development of their enterprise (COSTA et al, 2021; ENGELMAN, ZEN, FRACASSO, 2015; ENGELMAN, FRACASSO, 2013).

It is valid noticing that there are at least three distinct generations of incubators solidly established and that their evolution follows not only the evolution of the incubation concept per se but of the very market dynamics in terms of competitiveness, internationalization and business models. There is also a fourth generation of organizations that reflects the need for flexibility, digital strategies and overcoming geographic barriers, offering virtual services very similar to physical incubators (MIAN, LAMINE and FAYOLLE 2016). Table 2 summarizes these generations and their main features.

Table 2 – Different Generation of Business Incubators

Nature	Focus	Services
1 st Generation	Facilities and infrastructure	<ul style="list-style-type: none"> • Free or low rent through subsidized costs. • Shared facilities - meeting room, auditorium, cafeteria, etc. • Telephone, internet, secretarial services, etc.
2 nd Generation	Corporate intelligence	<ul style="list-style-type: none"> • Training in relevant areas of management (sales, marketing, strategy, budget, etc.). • Support in the recruitment and selection of skilled labour. • Generation of intellectual capital through market studies, content creation and technology transfers. • Specialized consultancy services (integrated to the incubator or outsourced) in legal or governmental matters.
3 rd Generation	Networking	<ul style="list-style-type: none"> • Facilitation of networking between incubated companies and relevant stakeholders. • Support for the internationalization process. • Integration of incubated companies with investors, business angels and venture capitalists. • Facilitation of participation in international events.
4 th Generation	Virtual	<ul style="list-style-type: none"> • Dissemination of information. • Support for the formation of online networks. • Online business support services. • Generation of intellectual capital through market studies,

Source: Costa et al. (2019)

Methodology

The research undertaken was both exploratory and descriptive. As it sought to analyse the existing barriers to the internationalization of incubated companies in the city of Natal/RN from the local entrepreneurs' perspective – an effort that had not been carried out previously – in order to describe facts and phenomena related to their organizations and perspective vis-à-vis the international market (SAUNDERS et al., 2016).

The research was divided into two parts. Firstly it focused on the bibliographical and documental analysis, in order to build a robust conceptual framework that could guide the research towards the most relevant information about the theme, allowing for the identification of the main constructs necessary to build an effective research instrument from a content analysis approach, identifying the phenomena, objects and attributions within each constructs (BRYMAN; BELL, 2011; BARDIN, 2011).

Secondly, once the research instrument was developed, a quantitative data collection was undertaken during three months (July to September, 2018), as it was sought to quantify subjective and personal data utilizing statistical tools (SAUNDERS et al, 2016).

The criteria to decide the relevant incubators/companies that were studied are summarized on Table 3:

Table 3 – Eligibility Criteria

Criteria	Eligibility Requirements
Time of Operation for Incubators	At least one year (not counting time to choose projects)
Nature of Incubator	Both private and public institutions.
Focus	Incubated companies only. Neither pre-projects nor graduated companies were analysed.
Type of Business	Restricted to business with potential for internationalization, thus excluding cultural and social projects as well as regional ones.

Source: Costa, 2018.

Table 4 presents the different business incubators active in Natal/RN during the time of the research.

Table 4 – Business Incubators in Natal/RN – General Features and Relevance for the Study

Business	Affiliation	Time	Aim	Focus	Number	In	Relevant
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Incubator		of Ops (years)			of Incubated Cos.	activity?	
Inova Metrópole	UFRN	4	Incubation & Pre- Incubation	IT	12	Yes	Yes
Bioinova	UFRN	-x-	Incubation & Pre- Incubation	Life Sciences	0	No	No
inPacta	UFRN	3	Pre- Incubation	Variable	0	Yes	No
Tecnatus	UFRN	-x-	Incubation & Pre- Incubation	Variable	0	No	No
ITNC	IFRN	20	Incubation & Pre- Incubation	Variable	8	Yes	Yes
ITCART	IFRN	2	Incubation & Pre- Incubation	Culture & Sports	2	Yes	No
Empreende	UnP	3	Incubation & Pre- Incubation	Variable	5	Yes	Yes
Catavento	UERN	- x -	Incubation & Pre- Incubation	Social	0	No	No

Source: Costa (2018)

Based on tables 3 and 4, the universe of the study comprised a total of 25 companies from three different business incubators – Inova Metrópole/UFRN; ITNC/UFRN and Empreende/UNP. During the data collection stage, three companies were excluded, one at Empreende as they were closing operations and two at Inova Metrópole, one of them had changed operations to a different city and another could not be reached in time (Costa, 2018).

The reduced number of the universe made possible to study it in detail without the need for statistical samples, thus the research was a census (BRYMAN; BELL 2011; MONTGOMERY; RUNGER, 1993).

Due to the limited size of the universe researched – 22 companies in total – and only 41 questions composing the research instrument, it was not possible to utilize neither the factor analysis to identify complex interrelationships amongst the items, nor the Cronbach's Alpha to estimate the reliability of the research instrument (SINGH, 2006). Thus, the data analysis was carried using descriptive statistics tools: Mean, Mode, Median, Standard Deviation and Box Plot Analysis (JOSHI, 2015).

The following descriptive statistics analysis was performed according to a

confidence level (Alpha) 0.95 and significance level (Beta) of 0.05 (MONTGOMERY; HUNGER, 1993).

Table 5: Descriptive Statistics Analysis

		Construct 1 Strategic Management of Internationalization	Construct 2 Business Incubators Strategy	Construct 3 Internal Barriers (Mgmt. & Ops)	Construct 4 External Barriers
Inova Metropole UFRN	Mean	2,18	1,69	2,83	1,36
	Mode	1,00	2,00	0,13	1,00
	Median	2,00	2,00	3,00	1,00
	Standard Deviation	0,09	0,14	3,00	0,12
ITNC IFRN	Mean	2,22	2,27	3,02	1,39
	Mode	2,00	2,00	3,00	0,00
	Median	2,00	2,00	3,00	1,00
	Standard Deviation	1,27	1,39	0,94	1,30
Empreende UNP	Mean	2,08	2,46	2,79	1,31
	Mode	1,00	3,00	3,00	1,00
	Median	2,00	3,00	3,00	1,00
	Standard Deviation	0,14	0,19	0,19	0,17

Source: Elaborated by the authors.

Based on the figures on table 5 it is possible to assert that the median and mode values are acceptable as they are sufficiently close to the mean value, which indicates that the data can present a similar behaviour to the normal distribution (MONTGOMERY; HUNGER, 1993).

As a result of that, the authors have decided to use the mean values to elaborate a ranking per construct, thus establishing parameters to analyse how advanced were the companies in the internationalization process and what were the main barriers the entrepreneurs faced. The ranking were calculated by construct, however, the individual values for each questions were also analysed in order to evaluate the effects of the statistical dispersion of the data. Table 13 brings some considerations regarding the ranking calculation.

Table 6: Internationalization Ranking Evaluation.

Value	Possible interpretation
Above 3.0	Ideal score: Companies with strong internationalization potential.
From 2.5 to 2.9	Good score: Companies with basic conditions for internationalization.
From 2.0 to 2.4	Regular score: Companies with positive aspects, but in need of structural corrections to reach the right conditions for internationalization.
From 1.5 to 1.9	Poor score: Companies without significant competitive advantages, making the

From 1.0 to 1.4	internationalization process extremely difficult. Unsatisfactory score: Companies may not even have isolated traits that favour internationalization.
Below 1.0	Null score: Entrepreneurs may not know basic information about their own businesses.

Source: Elaborated by the authors

The ranking evaluation on table 6 does not follow any specific standard or similar rankings found in the literature but rather were arbitrary values defined by the authors based on the idea that modern methodologies or the logical process of scientific discovery consists primarily of a set of – not necessarily systematic – rules for the evaluation of readily articulated theories (LAKATOS, 1978), that is, the method is an arbitrary rational procedure to achieve certain results. The researcher’s experience and common sense has considerable weight in this arbitrariness and should, therefore, express utility for the results (SAUDERS, 2016; FERRARI, 1982).

After the bibliographical and documental research, four interdependent constructs were defined as essential for the development of the research instrument. Each construct was developed following the logical structure of phenomenon, object and attribution in order to have an in depth theoretical framework (COSTA et al, 2019; BRYMAN; BELL, 2011; BARDIN, 2011).

The first construct is related to the phenomenon of the Strategic Management of Internationalization, having as main objects economic, cultural and management aspects with attributes associated with the strategic management response to internal and external barriers, the driving forces behind the process of internationalization and to the quality of their leaders’ networking (COSTA et al, 2019). Table 7 below summarizes the construct and the interrelation of its elements:

Table 7: Construct 1

Phenomenon			
Strategic Management of Internationalization			
Object 1	Object 2	Object 3	Object 4
Economic Criteria	Strategic Planning	Cultural Criteria	Knowledge Management & Innovation
Attributions	Attributions	Attributions	Attributions
1. Global Demand 2. International Competition	1. Growth Strategy (Incremental or Born Global) 2. Networking Planning 3. Multiple Sales Channels 4. Adequacy of the Organizational Structure for the	1. Consumers’ behaviour 2. Cultural Proximities 3. Corporate Mission 4. Previous International Activities	1. Knowledge Accumulation 2. Unique Nature of Expertise 3. High Tech Start-ups/E-Businesses 4. Entrepreneurial Activity on the International Market

External Market

- 5. Innovation :
Efficiencies &
Deficiencies
- 6. Oriented Action
- 7. Resource Planning
- 8. Innovative
Products/Services
- 9. New Production
Methods
- 10. Focus on New
Markets
- 11. Ind. Sector
Restructuring

Source: Costa et al (2019)

The second construct addresses the phenomenon of the business incubators strategy, focusing on objects related to their operations, resources, their response to the internationalization drives and their strategy for networking management, focusing on attributes related to their services, nature and structure (COSTA et al, 2019).

Table 8: Construct 2

Phenomenon Business Incubators Strategy		
Object 1 Incubators Management	Object 2 Entrepreneurial Orientation	Object 3 Networking Management
Attributions 1. Physical Resources 2. Consulting Services, Counselling, Research and Training 3. Focus on International Quality Standards	Attributions 1. Participation and Guidance in Networking Events 2. Guidance on Technology Transfer Initiatives 3. Inter- relation with Graduated Companies, other Incubators and Stakeholders	Attributions 1. Recruitment focusing on Entrepreneurial Skills 2. International Business Selection Criteria 3. Focus on Internationalization and Exportation

Source: Costa et al (2019)

The third construct focuses on the phenomenon of internal barriers – both operational and managerial – it is the phenomenon with the largest number of objects as they are closely connected to first construct of strategic management. The conceptual distinction derives from the different perspective, aiming at tangible and intangible resource restrictions as well as operational barriers and competitiveness (COSTA et al, 2019).

Table 9: Construct 3

Phenomenon Internal (Managerial & Operational) Barriers				
Object 1 Resource Restrictions	Object 2 Poor Networking	Object 3 Low Entrepreneurial Orientation	Object 4 Lack of Competitiveness	Object 5 Management Restrictions
Attributions 1. Lack of Human Resources	Attributions 1. Failures in the Development,	Attributions 1. Negative Attitude (Risk	Attributions 1. Poor Knowledge and Innovation	Attributions 1. Difficulty in gaining the trust of

2. Low Focus on R&D	Identification and Communication with Clients, Partners, Suppliers and Investors	Aversion and Dependence on Government Grants)	Management	stakeholders
3. Lack of Information About External Markets	2. Failure to identify potential customers	2. Attention Aimed Only at the Exploitation of the Internal Market	2. Lack of Product Quality (International Accreditations and Reputation)	2. Lack of International Expertise – External Trade
4. Inappropriate Sales Channels	3. Difficulty with Technology Transfer	3. Lack of international Experience from the human resources	3. Logistic Limitations	3. High Turnover Levels
5. Lack of Access to New Technologies		4. Poor Perception of Cost/Benefit and Profitability	4. Inadequate Technology	4. Difficulties in the Recruitment, Selection and Development of workers
			5. Deficiencies in the Process of R&D	
			6. Little Time dedicated to Internationalization Operations	

Source: Costa et al (2019)

The fourth and final construct addresses the external barriers to the internationalization process, focusing on objects such as market restrictions, political/governmental issues, physical as well as cultural distances. All objects both on a microeconomic and macroeconomic level and their respective attributions are, per definition, out of managerial control. The risks attached to such constructs, nonetheless, may be mitigated by a strategic planning driven towards internationalization and growth, thus, they are intrinsically related to constructs 1 and 3 and are an essential part for the construct 3, as business incubators have to address effectively both external threats and opportunities (COSTA et al, 2019).

Table 10: Construct 4

Phenomenon			
External Barriers			
Object 1	Object 2	Object 3	Object 4
Market Restrictions	Political / Governmental Barriers	Physical Distances	Cultural Distances
Attributions	Attributions	Attributions	Attributions
1. Different Product / Service Applications	1. Trade and Customs Barriers	1. Precarious Infrastructure	1. Lack of Knowledge about Local Culture
2. Competitive Local Markets	2. Variation in Country Regulations	2. High Transportation Costs	2. Language barriers
3. Different Quality Standards	3. Complex Legal Restrictions	3. Logistics Barriers	3. Religious Barriers
4. Restrictions on Intellectual Property	4. Difficulties in the Transfer of Funds		4. Difficulty in adapting Management Styles
5. Monopolistic Markets	5. Unstable Governments		
6. Low Quality Local Labour	6. High Bureaucracy Levels		
7. Difficulty in Adapting the Marketing Mix	7. High Taxation		

Source: Costa et al (2019)

Taking into account that the constructs abovementioned are not isolated driving forces in the internationalization processes, but in fact essentially interrelated, an initial analysis can address those constructs separately, however, an effective research instrument must address all constructs in order to present in detail the barriers that most affect the local entrepreneurs.

Results

The statistical results are displayed on tables 11, 12, 13 and 14.

Table 11: Construct 1 – Strategic Management of Internationalization

		INOVA METRÓPOLE	EMPREENDE	ITNC	Ranking per Question
Q1	Strategic plan oriented towards international growth.	0.90	1.80	1.88	1.53
Q2	Focus on global demand.	3.20	2.80	3.63	3.21
Q3	International competitiveness.	2.50	2.50	3.50	2.83
Q4	Pre-established international contacts.	2.00	2.30	2.25	2.18
Q5	Flexibility of sales channels.	3.30	3.50	3.00	3.27
Q6	Structure ready to serve the foreign market.	2.60	2.80	2.00	2.47
Q7	Knowledge of global consumer behaviour.	1.40	1.50	2.50	1.80
Q8	Cultural similarities.	2.70	2.80	2.63	2.71
Q9	Corporate mission.	1.80	2.30	1.63	1.91
Q10	Previous experience.	2.10	1.50	1.38	1.66
Q11	Participation in network activities.	1.70	1.30	1.75	1.58
Q12	Academic background.	2.20	2.30	2.38	2.29
Q13	Foreign languages.	3.20	1.80	2.13	2.38
Q14	Nature of expertise.	2.70	2.00	2.13	2.28
Q15	Characteristics of high tech start-ups.	2.50	2.50	1.88	2.29
Q16	Strategic plan oriented to the international market.	1.20	1.80	2.00	1.67
Q17	Contacts with investors.	1.50	1.30	1.50	1.43
Q18	Network.	1.40	1.00	1.38	1.26
Q19	Suitability of the brand.	2.60	2.30	2.75	2.55
	Incubator Ranking	2.18	2.08	2.22	General Ranking 2,17

Source: COSTA (2018).

Table 12: Construct 2 – Business Incubators Strategy

		INOVA METRÓPOLE	EMPREENDE	ITNC	Ranking per Question
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Q20	Physical resources suitable for internationalization.	1.60	2.80	2.13	2.18
Q21	Consultancy. advice. research and training focusing on internationalization.	1.50	3.30	2.13	2.31
Q22	Focus on international quality standards.	1.50	2.30	1.75	1.85
Q23	Recruitment focused on entrepreneurial competence.	3.10	2.30	3.25	2.88
Q24	Selection focused on projects of an international nature.	1.20	2.00	2.38	1.86
Q25	Information on exports.	1.40	2.80	2.25	2.15
Q26	Facilitation of international events.	1.50	2.00	2.00	1.83
Incubator Ranking		1.69	2.46	2.27	General Ranking 2.15

Source: COSTA (2018).

Table 13: Construct 3 – Internal Barriers (Mgmt. & Ops)

		INOVA METRÓPOLE	EMPREENDE	ITNC	Ranking per Question
Q27	Facility on technology transfers.	1.70	2.00	2.00	1.90
Q28	R&D focused on continuous innovation.	3.10	2.80	3.38	3.09
Q29	Strategic planning focused on the process of innovation and R&D.	2.50	2.80	3.00	2.77
Q30	Allocation of resources for innovation.	3.40	2.80	3.25	3.15
Q31	Innovative products / services.	3.40	3.50	3.50	3.47
Q32	Innovative methods of production / commercialization.	2.70	3.00	3.25	2.98
Q33	Focus on new markets.	3.00	2.80	2.75	2.85
Incubator Ranking		2.83	2.81	3.02	General Ranking 2,89

Source: COSTA, (2018)

Table 14: Construct 4 – External Barriers

		INOVA METRÓPOLE	EMPREENDE	ITNC	Ranking per Question
Q34	Access to mechanisms to obtain government credit.	2.10	1.75	1.88	1.93
Q35	Favourable Foreign Exchange Rates.	1.00	1.50	1.38	1.29
Q36	International patents.	1.30	1.25	1.38	1.33
Q37	Knowledge about regulations.	0.90	1.50	1.75	1.38
Q38	Compliance with legal restrictions.	1.50	0.75	1.00	1.10
Q39	Access to funds transfer channels.	1.10	0.75	0.88	0.93
Q40	Infrastructure suitable for	1.50	1.25	1.50	1.43

Q41	internationalization. Financial / budget planning.	1.50	1.75	1.38	1.56
	Incubator Ranking	1.36	1.31	1.39	General Ranking 1,35

Source: COSTA, (2018).

Based on the data abovementioned, the authors reached the following conclusions regarding the barriers affecting the internationalization process for the incubated companies in the city of Natal/RN:

There are two main types of barriers that encompass different attributes from the constructs analysed, creating a set of unique problems to overcome.

The first and most prominent barrier is related to the entrepreneurs' technical limitations to address external barriers. The items with the lowest score point out to the fact that the entrepreneurs are not prepared to face some technical and well known barriers, not having accessed, in certain cases, open and available information. The key attributes of that barrier are:

1. Knowledge of fund transfer channels – Score of 0.93
2. Compliance with legal restrictions – Score of 1.10
3. Knowledge of risk mitigation related to exchange rates – Score of 1.29
4. Knowledge of regulations – Score of 1.38
5. Access to adequate infrastructure – Score of 1.43
6. Focus on international standards of quality – Score of 1.85

Given that one of the most primordial functions of business incubators is the provision of specialized training and consultancy in key areas that can support sustainable growth (ENGELMAN; ZEN; FRACASSO, 2015) and also taking into account that the points above could potentially be mitigated by an adequate strategy of knowledge management, it is possible to infer that topics on internationalization should become a priority within the incubators' training programme. Furthermore, since all three business incubators studied are part of higher education institutions – thus having access to highly qualified experts and key information – such programmes may greatly benefit from being developed in partnership with the universities, expanding networking opportunities.

The second type of barrier noticed in the study is related to strategic management limitations, derived from poor strategic planning as well as infective

leadership attitude from senior managers. The key attributes that make up that barrier are:

1. General networking – Score of 1.26
2. Network with investors – Score of 1.40
3. International growth plan – Score of 1.53
4. Participation in networking activities – Score of 1.58
5. Previous international experience – Score of 1.66
6. Facilities in technology transfer – Score of 1.90

The strategic management barriers are resumed by a deficiency of an advanced strategy for networking, all points above demonstrate facets of that problem. Such limitations may be a reflection on the low scores on point (3) above, without an international growth strategy, internationalization may occur accidentally on a best case scenario, but it is more likely that the companies do not reach the conditions to overcome the barriers and remain limited to their local markets (BAUM, SCHWENS; KABST, 2013). The influence of the business incubators on that specific barrier derives from the understanding of incubators as primarily a networking facilitator, especially those that are part of institutions of higher education (ENGELMAN; ZEN; FRACASSO, 2015); thus, it is necessary for the incubators to incorporate those elements into their incubation process (COSTA et al, 2021).

Conclusion

Based on the premise that internationalization is no longer a strategic option, but rather a pre-condition to survival the present work aimed at identifying, from the local entrepreneurs' perspective, the barriers to the process of internationalization of the companies incubated in the city of Natal/RN.

It was noticed that there are two specific albeit interrelated barriers: external barriers increased by entrepreneurs' and incubators' technical limitations; and strategic management barriers associated with poor networking and lack of an international expansion planning. That has led to the conclusion that there is not a clearly delineated internationalization strategy amongst the analysed companies, although few companies are in a more advanced stage, already targeting foreign markets.

The research conducted did not aim at proposing solutions to the identified problems, nonetheless, it is possible to infer that in order to overcome the barriers abovementioned, business incubators and entrepreneurs should focus on two interrelated strategies: Networking optimization to overcome the isolated nature of the business and improve their relationships with stakeholders as well as knowledge management improvements to address the entrepreneurs' technical limitations and lay the foundations for the internationalization process.

The work's main contribution is to bring the discussion about internationalization to the reality of local incubated companies, which had not yet been undertaken by previous researches, besides pointing to the specific types of barriers that need to be faced by entrepreneurs, which is beneficial from an academic as well as professional perspective.

As limitations, it can be argued that the research instrument has not been validated due to the limited universe studied; thus, to extend the research to a regional or national level, it is essential to validate the research instrument. Furthermore, due to the small universe studied, some of the information presented is prone to undergo significant changes in a short period of time.

As suggestions for future research, the authors recommend expanding the current research, incorporating more incubators in the state of Rio Grande do Norte as well as other states, in order to build a robust comparative study.

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Appendix

Questionnaire for the Entrepreneurs

Company:

Fill in the last column of the table below, according to the following scale:

- 0. I don't know
- 1. Totally disagree
- 2. Partially disagree
- 3. Partially agree
- 4. Totally agree

1	My company has a strategic plan oriented towards international expansion.	
2	My product/service addresses a global demand.	
3	My product/service has characteristics that make it competitive on an international level.	
4	I have established contacts with international partners.	
5	My product / service can be marketed through multiple sales channels.	
6	The company structure is adequate / can easily adapt to attend to the external market.	
7	My products/services were developed after studying the behaviour of different consumers on a global level.	
8	There are cultural similarities between the local market and neighbouring countries' market that facilitate the commercialization of my products/services.	
9	My company has a corporate mission already defined and it includes an	

	international perspective.	
10	I have already carried out entrepreneurial activity focused on the international market.	
11	I have already participated in trade fairs/congresses/international events focused on entrepreneurial activity.	
12	My history of studies favours understanding and / or acting in international markets.	
13	I speak at least one foreign language.	
14	The expertise present in my products / services is unique	
15	My company can be considered a high-tech start-up.	
16	My strategic planning takes into account the international market.	
17	I have access to international investors.	
18	I consider my networking with the external market to be satisfactory.	
19	My brand is suitable for an international market.	
20	The incubator offers adequate physical resources for the development of my company with a view to internationalization.	
21	The incubator offers consulting, advice, research and training for internationalization.	
22	The incubator prepares us to meet international quality standards.	
23	The recruitment process in the incubator established criteria focused on the entrepreneurial competence of the candidates.	
24	The selection criteria for companies in the incubator focused on projects with products/services of an international nature.	
25	The incubator provides all the information I need regarding the exporting process.	
26	The incubator often organizes/offers the opportunity to attend international events.	
27	My network favours technology transfer.	
28	The efficiencies/shortcomings of my product/service have been studied in order to favour a continuous innovation process.	
29	Our planning is focused on the process of innovation and R&D.	
30	The resources in my company are allocated taking into account the innovation activities.	
31	My product/service is innovative.	
32	My company has developed innovative methods to producing/marketing its products/services.	
33	My product/service focuses primarily on new markets not yet served by existing products/services.	
34	I have access to government credit mechanisms.	
35	Exchange rates favour the international expansion of my company.	
36	My company has international patents.	
37	I know the regulatory variations between my country and my international target market.	
38	I understand the legal constraints involved in the internationalization process.	
39	I know the best channels for funds transfer.	
40	My company has access to the appropriate infrastructure to expand internationally.	

41	My company has a financial/budget planning that encompasses the reduction of logistics costs related to international expansion.	
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