



INTERNATIONALIZATION BARRIERS FACED BY TECHNOLOGY-BASED SMALL AND MEDIUM ENTERPRISES.

BARREIRAS DE INTERNACIONALIZAÇÃO ENFRENTADAS POR PEQUENAS E MÉDIAS EMPRESAS DE TECNOLOGIA.

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ABSTRACT:

The work aims to identify the barriers to the internationalization of technology-based SMEs in the state of Rio Grande do Norte. A theoretical framework was developed encompassing four main constructs about internationalization barriers. In total, 24 companies were evaluated; the sample was non-probabilistic, based on convenience. A cluster analysis was developed based on normalization of the observed frequencies so that comparisons of the companies' performance could be carried out. It was noticed that the external barriers seem to be the most significant for the companies. Also, there was a lack of strategic management drive, leading to dispersed internationalization initiatives.

Keywords: Internationalization; Internationalization Barriers; Technology-Based SMEs; Entrepreneurship; Cluster Analysis.

RESUMO

O trabalho busca identificar as barreiras para a internacionalização das PMEs de base tecnológica no estado do Rio Grande do Norte. Foi desenvolvido um referencial teórico englobando quatro construtos principais sobre barreiras à internacionalização. No total, foram avaliadas 24 empresas; a amostra foi não probabilística, por conveniência. Uma análise de cluster foi desenvolvida com base na normalização das frequências observadas para que as comparações do desempenho das empresas pudessem ser realizadas. Percebeu-se que as barreiras externas parecem ser as mais significativas para as empresas. Além disso, houve falta de direcionamento estratégico da gestão, levando a iniciativas de internacionalização dispersas.

Palavras-chave: Internacionalização; Barreiras de Internacionalização; PMEs de Base Tecnológica; Empreendedorismo; Análise de Cluster.





1 INTRODUCTION

Businesses in general, including SMEs, are increasing their internationalization process exponentially (CHANDRA, PAUL and CHAVAN, 2021; MCDUGALL; JONES and SERAPIO, 2014; GABRIELSSON et al., 2008). The rise of internationalization prone and even born global companies is a consequence of a more diversified global economy, in which diverse organizations – including SMEs – can succeed internationally (KNIGHT and LIESCH, 2016). Such success, however, is not free from various barriers and risks, smaller companies are not just reduced versions of large corporations, their structure and behaviour differ considerably, demanding specific studies to fully apprehend their specificities (COSTA et al., 2018; LOVE and ROPER, 2015; BRAMBILLA, LEDERMAN and PORTO, 2012).

The interest for the study of internationalization has been growing over the past decades, when the phenomenon changed from something restrict to larger companies and started to be relevant to SMEs as well, driving competitiveness and innovation (MUELLER-USING e WEDEMIER, 2020; COSTA et al, 2019; KNIGHT and LIESCH, 2016).

Technology based companies in general, especially start-ups, have intrinsic conditions that are more conducive to internationalization, as they face lower geographic and linguistic barriers supported by a digital business model, creating knowledge and networks at a faster pace, which increases international competitiveness (VENDRUSCOLO and GALINA, 2020; KNIGHT and LIESCH, 2016; GABRIELSSON et al, 2008). In fact, the overall internationalization barriers have been reduced due to globalization; however, they remain relevant and rather complex, driving the need to further studies on how to surpass them, especially for SMEs).

Several researchers point that internationalization is, first and foremost, a result of entrepreneurial predisposition (THOMAS; PASSARO and QUINTO, 2020; BAUM, SCHWENS and KABST, 2013), and thus, potential barriers are also related to individual perceptions (KAHIYA, 2017; BENZING; CHU and KARA, 2009).

For some SMEs, internal barriers, and hence, barriers arising from within firms, are more relevant than external barriers caused by company-independent circumstances;





however, it is still necessary to study the phenomenon in more depth, as most studies tend to neglect internal barriers of internationalization (MUELLER-USING and WEDEMIER, 2020; TOULOVA, VOTOUPALOVA and KUBICKOVA, 2015).

According to the literature, it is possible to raise the following points necessary for a company to enter the internationalization process: i) entrepreneurs focused on the international market; ii) adequacy of the organizational structure for the external market; iii) strategic focus; iv) involvement in international networking with customers, suppliers and partners; and v) sensitivity about the cultural differences of each region and the challenges of adaptation (KNIGHT and LIESCH, 2016; OVIATT and MCDUGALL, 1994).

For the purposes of the current work, the term internationalization will refer to the phenomenon of consolidation of an organization's economic activities in foreign markets, without, however, also ignoring the cultural aspects of such consolidation, following both an incremental and accelerated model (KNIGHT and LIESCH, 2016; RUZZIER; HISRICH and ANTONCIC, 2006). It is also assumed in the current article that internationalization has become an essential precondition for SMEs aiming at the consolidation of their competitive advantage as well as future growth and development (PAUNOVIĆ and PREBEŽAC, 2010; ZIMMERER and SCARBOROUGH; 2009).

Thus, the present article aims to determine the main barriers to the internationalization of technology based SMEs in the state of Rio Grande do Norte/Brazil in order to analyse potential strengths and weaknesses that may lead to the development of adequate strategies to support these organizations.

2 THEORETICAL BACKGROUND

There are many different approaches to distinguish internationalization barriers, on a basic level they can be classified as internal and external. Internal barriers are quite often management barriers, related to information, processes and marketing, as well as resource barriers, referring not only to financial resources, but also human and intellectual capital. On the other hand, the external barriers are considerably more multifaceted, they





can be legal, procedural, political, economic, commercial, geographic, environmental, cultural and specific (relating to unique problems and specifications in a given country) (MUELLER-USING e WEDEMIER, 2020; COSTA et al, 2019; NARAYANAN, 2015; SEKLIUCKIEN, 2013).

Internal barriers are quite so often more urgent in the early stages of the internationalization process, not least because they are also associated with perceived barriers by managers. Once the internal barriers are addressed, the focus on overcoming external barriers is much greater, especially regarding commercial partnerships. The effects of learning and accumulation of resources, in addition to efficient innovation and knowledge management, are also vital to surpassing internal barriers as companies expand their processes (KAHIYA, 2017; BENZING; CHU and KARA, 2009).

The barriers can also be classified as specific or general. The specific barriers are related mainly to the company, its managers and competitors as well as operating costs, exclusive legislation affecting the business, the limitations of its networking, business models and its expansion strategy. The general barriers, on the other hand, relate to the macro environment, especially economic and political barriers besides the entry and operation barriers (COSTA et al, 2019; OJASALO and OJASALO, 2011).

Some authors argue that barriers related to internationalization could be summarized into four categories of liabilities: i) cost of expansion; ii) liability of newness; iii) liability of foreignness; and iv) cost of infrastructure (WASOWSKA, 2016; SCHWEIZER, 2013).

It is not possible to find a consensus about the specific number of barriers as they vary considerably based on region, industry and other specific factors, including entrepreneurs' international drive (KAHIYA, 2013; PAUNOVIC and PREBEZAC; 2010). However, when studying the Brazilian market with an emphasis on new technology-based companies, Cahen, Lahiri and Borini (2016) raised three main obstacles to the internationalization process: i) institutional barriers; ii) organizational capacity barriers; and iii) human resources barriers.

Regarding SMEs, other factors are also relevant: employees' lack of linguistic knowledge, lack of experience with foreign markets, high promotion costs and lack of information about foreign markets (WASOWSKA, 2016; TOULOUVA; VOTOUPALOVA e





KUBICKOVA, 2015). Nonetheless, size remains the key limiting factor to the internationalization process to SMEs, as their financial and operational capacities are rather limited. However, it is believed that SMEs can face current obstacles through a strategy of differentiation and emphasis on networking activities (COSTA et al, 2018; KORSAKIENĖ, DISKIENĖ and SMALIUKIENĖ, 2015; KORSAKIENĖ and TVARONAVICIENE, 2012; ZAIN, 2006).

On the other hand, the agile nature of small companies when making decisions is a point of agreement amongst scholars and is generally regarded as a competitive advantage (COSTA et al, 2018; LOVE and ROPER, 2015; BRAMBILLA, LEDERMAN and PORTO, 2012). However, the SMEs decision-making process generally passes under the scrutiny of the owner/general manager, being sometimes a personal decision affected by the influence of individual perceptions. As a result, real barriers and non-objective, complex and essentially idiosyncratic barriers of perception affect the decision-making process as a whole (XIE and SUH, 2014; BAUM, SCHWENS and KABST, 2013; LIESCH et al, 2011).

On table 1 it is possible to see a summary of the different internationalization barriers found in the scientific literature, specifically focusing on SMEs:

Table 1: Internationalization Barriers

Type of Barriers	Variations
Lack of non-financial resources	<ul style="list-style-type: none">● Lack of human resources● Lack of trained R&D personnel● Lack of information about external markets● Inadequate sales channels● Lack of access to new technologies
Financial restrictions	<ul style="list-style-type: none">● Inadequate funds● Difficulty in getting government credit● Long and complicated processes to get bank credit● Little access to FDI● High cost of capital
Low entrepreneurial orientation	<ul style="list-style-type: none">● Non-entrepreneurial attitude (risk aversion and reliance on government subsidies)● Absence of risk mitigation strategies● Resources allocated exclusively in the exploitation of the internal market





Networking barriers	<ul style="list-style-type: none">● Difficulty in technology transfer and knowledge exchange● Lack of international visibility● Difficulty in gaining the stakeholders' trust● Communication barriers
Lack of competitiveness	<ul style="list-style-type: none">● Poor knowledge and innovation management● Lack of product quality (international accreditations and reputation)● Logistics and marketing limitations● Inadequate technology● Deficiencies in the R&D process
Political interference	<ul style="list-style-type: none">● Barriers to trade and customs● Variation in regulations between countries● Unstable Governments● High bureaucracy rate● High taxation
Industry Related Barriers	<ul style="list-style-type: none">● Threat of product substitution● Entry barriers● Barriers related to suppliers● High level of competition
Managerial restrictions	<ul style="list-style-type: none">● Lack of expertise in the area● High turnover rates● Time constraints on strategic planning● Lack of an international expansion strategy● Poor budget planning
Cultural distances	<ul style="list-style-type: none">● Cultural barriers● Language restrictions● Religious differences● Problems with leadership and management styles
Physical distances	<ul style="list-style-type: none">● Precarious infrastructure,● High travel costs,● Logistical and transportation barriers

Source: Adapted from Chandra, Paul and Chavan (2021) and Costa et al (2019).

It is worth noticing that many of those different types of barriers are profoundly interrelated and cannot be scrutinized in isolation or fully compartmentalized in simpler categories (e.g. internal and external) as many occur within and without the organization boundaries (COSTA et al, 2019; KAHIYA, 2017; CAHEN, LAHIRI and BORINI, 2016; TOULOVA, VOTOUPALOVA and KUBICKOVA, 2015; NARAYANAN, 2015; BAUM, SCHWENS and KABST, 2013).

Thus, based on content analysis (COSTA et al, 2019; BARDIN, 2011) the current authors were able to divide the internationalization barriers found in the literature into four





main constructs:

1. Strategic management barriers – related to strategic planning and entrepreneurs' long term perspective on business growth and international expansion. The main focus of the construct is the interaction between strategic management and the external and internal drivers that affect internationalization.
2. Networking – related to the entrepreneurs' personal characteristics, specifically their interaction with stakeholders. Given the importance of networking, it is perceived as a construct in its own right, but it is profoundly interconnected to the strategic management barriers.
3. Operation barriers – the construct focuses on barriers within the organization, its natural limitations, usually related to resources availability and allocation, including human resources and intellectual capital.
4. External barriers – it focuses on factors that are virtually out of the entrepreneurs' control, but can be mitigated through strategic planning. Its main objects of study are commercial restrictions, political and governmental barriers as well as physical and cultural distances.

3 RESEARCH METHOD

Given its objectives and *modus operandi*, the present research can be characterized as both exploratory and descriptive, for it seeks to analyse the existing barriers to the internationalization of technology-based companies from the local entrepreneurs' perspective, exploring a line of study not yet carried out whilst describing facts and phenomena relating to these organizations and their perspectives on internationalization (SAUNDERS, LEWIS and THORNHILL, 2016).

Its nature is both qualitative and quantitative, for despite the fact that to some extent it is focused on a level of reality that cannot be quantified, raising the perspectives and personal experiences of individuals and organizations being studied, the research also aims to quantify and measure the data, utilizing statistical tools in order to indicate





numbers to properties, objects and events, to give or obtain more complete insights (COSTA, 2018; SAUNDERS, LEWIS and THORNHILL, 2016). Table 2 specifies the research procedure adopted:

Table 2 – Research Procedures

Stage	Characterization	Methodology
1	Definition of the constructs for the development of the research instrument.	Bibliographic and documentary analysis.
2	Elaboration of the research instrument.	5 points Likert-type scale – The questions can be analysed separately as well as <i>per construct</i> , thus creating a composite scale.
3	Survey application and registration of the companies.	Questionnaires were applied in person or by email; the researcher was available to answer the questions raised. 24 of the 29 companies that responded to the questionnaire fit into the research criteria.
4	Database generation in Microsoft Excel® file. Analysis of collected data and Stata® MP – Parallel Edition 14.0	Descriptive measures of each variable were extracted. The total value for each construct was calculated.
5	Definition of groupings (clusters) corresponding to the companies participating in the study.	From the Ward's Method algorithm implemented in Stata® MP – Parallel Edition 14.0, six clusters were segmented. Also at this stage, three groups were excluded because they presented only one company each, a situation considered unsatisfactory for analysis by the specialists involved in this study.





6	Cluster Analysis	The frequency with which these respondents agreed by cluster and by construct was observed using the measure of central tendency, Mode. In this sense, a radar chart was created containing the number of common responses per construct in each cluster. In the interest of better representing the data, the analysts developed a scale conversion based on normalization of the observed frequencies so that comparisons of the performances of the developed groups of companies could be carried out properly.
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Source: Elaborated by the authors, based on Joshi (2015); Toledo (2014); Wu et al (2007) and Tony and Tonchia, (2001).

The research analysed technology-based small and medium-sized companies focused mainly on the development and manufacture of technology products or on the provision of technology as a service. It is important to emphasize that large companies or multinational companies, projects of incubated companies that are not yet on the market, retail companies, sales representatives, traders, traditional maintenance companies or public companies were not included in the analysis. 24 companies were evaluated; the sample was non-probabilistic, based on convenience (SAUNDERS, LEWIS and THORNHILL, 2016).

The research instrument was developed based on the relevant literature on internationalization barriers (See Table 1), which were divided, based on content analysis, into four fundamental constructs: i) Strategic management barriers; ii) Networking barriers; iii) Operations barriers; and iv) External barriers throughout 38 questions. The answers obeyed a five points Likert-type scale ranging on a symmetrical scale between “I Don’t Know” (0); “Strongly Disagree” (1), “Somewhat Disagree” (2); “Somewhat Agree” (3); and “Totally Agree” (4). The odd number of options was adopted so that neutral opinions or the absence of opinion were not ignored.

The analysis followed the reasoning sustained by Joshi (2015) and Jamielson (2004); focusing the main analysis on the mode value instead of mean or standard deviation; however, the data present in the results will also display mean and standard





deviation as they may offer insights to enrich the data analysis, avoiding hasty conclusions arising from unsatisfactory considerations.

4 RESULTS AND DISCUSSIONS

a. Companies and entrepreneurs profile

The data analysis will be initiated by the complementary questions of the survey (questions 39 to 49). The research focused primarily on the personal characteristics of entrepreneurs – gender, age, education and nature of their activities. Secondly, it was sought to obtain essential information about companies such as number of employees, time of operation, line of business, tax framework, and current internationalization oriented processes. The overall results are as follows:

- It was noticed that 88% of the managers interviewed were male, with a majority (42%) aged between 21 and 29 years, followed by those aged between 30 and 40 years old (33%) and over 40 years old (21%).
- In terms of educational level, most of the interviewees had concluded higher education (54%) with 13% of them still doing their degree courses, whilst 21% had concluded or were engaged in post-graduation studies.
- 54% had no other job or occupation, whilst 42% were involved in other businesses, worked autonomously or had a private job in a different organization.
- The companies were rather new, 38% had between one to three years of operation, and 21% between three to five years. Only 21% had over seven years of operations.
- 50% of the companies had up to 10 employees and 25% between 11 and 30.
- Regarding tax framework, 67% were on a simplified tax plan (Simples Nacional).
- Overall the companies have very little international experience, 21% of them had none whatsoever, whilst 33% were restricted to marketing research. 17% had partnerships with international businesses which led in 4% of the cases to





technology exchange. Only 17% had indeed attended to the international markets by exporting products or services.

b. Descriptive statistics

The first construct analysed is related to strategic management. On Table 3 it is possible to see the values per question as well as the total per construct:

Table 3: Strategic Management Results

	Questions	Mean	Mode	Median	Standard Deviation
Q1	My company has a strategic plan aimed at international expansion.	2,21	2	2	1,14
Q2	My product/service meets a global demand.	3,00	4	3	1,02
Q3	My product/service has characteristics that make it competitive on an international level.	3,04	3	3	1,00
Q5	My product/service can be marketed through multiple sales channels.	3,38	4	4	0,88
Q6	The structure of my company is adequate/can easily adapt to meet international demands.	2,96	4	3	1,12
Q7	My product/service was developed after studying the behaviour of different consumers on a global level.	2,83	2	3	1,05
Q9	My company has its corporate mission defined and it includes an internationalized perspective.	2,58	4	2,5	1,14
Q1 2	My educational background favours understanding and/or acting in international markets.	2,71	3	3	0,91
Q1 4	The expertise present in my products/services is unique.	2,58	3	3	0,93
Q1 5	My company can be considered a high-tech start-up.	3,04	4	3	1,12
Q1 6	I have strategic planning focused on the international market.	2,08	1	2	1,06
Q1 9	My brand is suitable for operating in international markets.	3,08	4	3	1,06
	Total	2,67	3	3	1,11





On analysing Table 3, it is possible to see that based on the Mode value (3), the entrepreneurs seem to trust their companies have a somewhat satisfactory level of strategic management addressed to international expansion, even though the isolated results of Q1 and Q16 point out to a lack of overall strategic planning, which suggests that there is an absence of leadership with an international focus, which can lead to the underutilization of potential competitive advantages. The results seem to be inconclusive and demand a further investigation, as the literature points out that an international expansion and growth plan is a fundamental condition to the internationalization process (COSTA et al, 2019; KNIGHT and LIESCH, 2016).

Table 4 focuses specifically on the networking aspects related to internationalization and its potential barriers.

Table 4: Networking Results

	Questions	Mea n	Mod e	Media n	Standard Deviation
Q4	I have established contacts with partners on an international level.	1,96	1	2	1,08
Q8	There are cultural similarities between the local market and the market in neighbouring countries that facilitate the sale of my product.	2,96	3	3	0,81
Q10	I have already performed an entrepreneurial activity aimed at the international market.	2,00	1	1,5	1,18
Q11	I've participated in international fairs/congresses/events focused on entrepreneurial activity.	2,79	4	3	1,28
Q13	I have mastered at least one foreign language.	3,29	4	3	0,81
Q17	I have access/contact with international investors.	2,00	1	2	0,93
Q18	I consider my networking with the foreign market satisfactory.	2,17	2	2	1,01
Q20	My networking favours technology transfer	2,83	3	3	1,01





Total 2,66 3 3 1,11

Once again, there is an overall positive result both on the values. However, Q4, Q17 and Q18 show a general problem with regards to efficient networking processes. That may be the result of poor networking planning and lack of an international expansion strategy.

The managers and entrepreneurs interviewed seems to have the right profile to lead the internationalization process, as it can be perceived in Q11 and Q13; however they still have no substantial experience (Q10), perhaps due to their age or the fact that the companies are rather new in the market as it can be seen in the companies and entrepreneurs profile.

Table 5 presents operational barriers to internationalization. It focuses on processes, innovation and quality of products and services.

Table 5: Operation Barriers Results

Questions	Mean	Mode	Median	Standard Deviation
Q21 The efficiencies/deficiencies of my product/service were studied in order to favour a continuous innovation process.	3,54	4	4	0,98
Q22 The organizational planning of my company focuses on the innovation and R&D process.	3,13	4	3	1,08
Q23 The resources in my company are allocated with a view to innovative activities.	3,38	4	3,5	0,88
Q24 My product/service is innovative.	3,54	4	4	0,66
Q25 My company has developed innovative methods of production/marketing of its products/services.	3,17	3	3	0,92
Q26 My product/service essentially focuses on new markets not yet served by existing products/services.	2,96	3	3	0,75
Total	3,28	4	3	0,90

The operational barriers seem to be the least significant for the internationalization of the companies analysed. The values present a very positive perspective from the managers/entrepreneurs. However, it is important to note that those results refer to





companies' performance in their local market, as very few have expanded internationally – only 17% had international commercial experience. Thus, it is necessary to analyse those values *vis-à-vis* the values of Table 3 and 4. Q26 also demonstrates that it is unlikely that those companies may face blue waters (KIM and MAUBORGNE, 2005), as they do not target new or untouched markets/business models.

Table 6 is related to external barriers: legal, political and economic factors as well as financial/budgetary, human capital and infrastructure issues over which the companies exert no direct influence, but can mitigate potential risks through strategic planning.

Table 6: External Barriers Results

Questions	Mean	Mode	Median	Standard Deviation
Q27 I know and have access to the mechanisms for obtaining government credit.	2,21	3	2	1,02
Q28 Exchange rates favour my company's international expansion.	1,96	1	2	1,12
Q29 For my company, foreign markets are not more competitive than the domestic market.	2,38	3	2	0,97
Q30 My company has an internationally protected patent(s).	1,79	1	1	1,02
Q31 The quality of the local workforce does not hinder the internationalization of my company.	2,88	3	3	0,95
Q32 The quality of the workforce abroad does not hinder the internationalization of my company.	2,42	3	3	1,02
Q33 The trade/customs barriers that my company would face in the target international markets do not hinder the internationalization process.	2,29	1	2	1,16
Q34 I know the variations in regulations between my country and my target international market.	2,08	2	2	1,02
Q35 I understand the legal restrictions involved in the internationalization process.	1,92	1	2	1,06
Q36 I know the best channels for transferring funds.	2,04	1	2	1,12
Q37 My company has access to adequate infrastructure to expand internationally.	2,50	2	2,5	1,06
Q38 My company has a financial/budgetary planning that encompasses the reduction of logistical costs related to international expansion.	1,92	1	2	1,21
Total	2,20	1	2	1,08



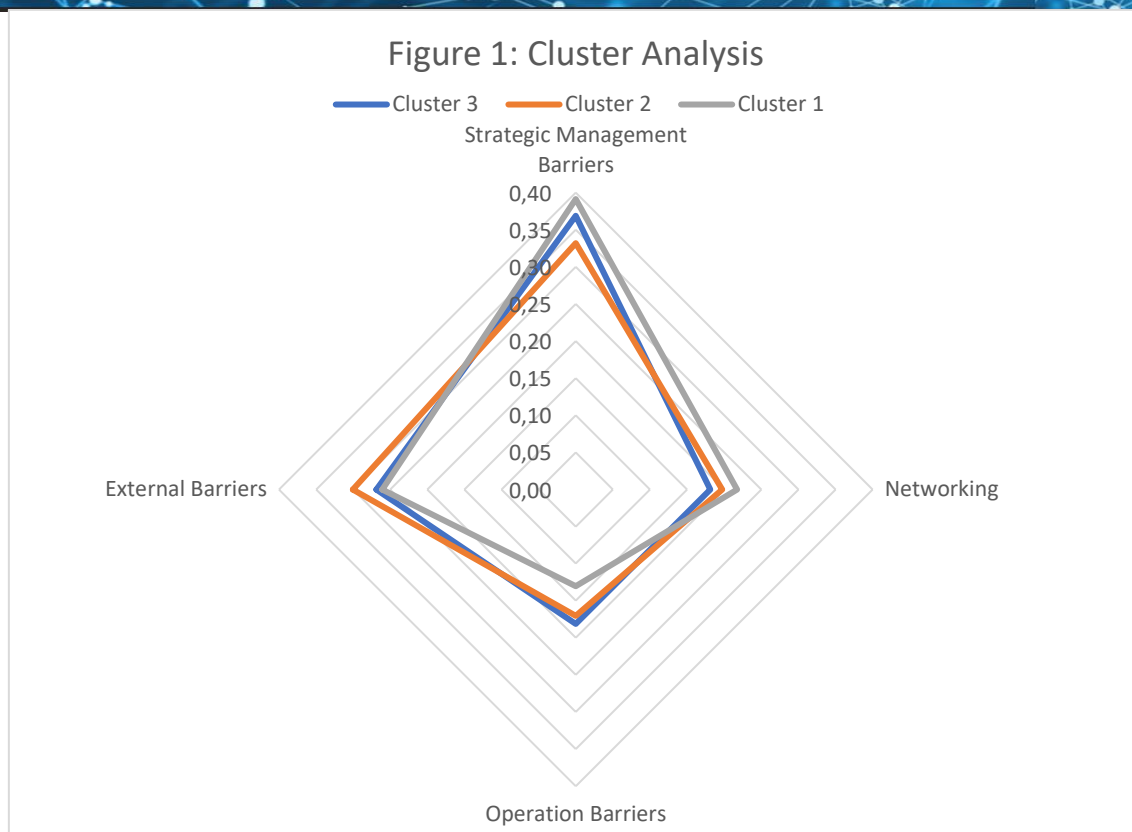


The analysis of Table 6 demonstrates that the external barriers seem to be the most significant ones to the managers/entrepreneurs interviewed. All statistical values analysed indicate overall deficiencies. Q28 has a particularly troublesome meaning, given the favourable exchange rates (to export) and the overall economic performance towards international growth Brazil has experienced in the last decades (MDIC, 2020).

Another key point is that despite the fact that the companies studied were all technology based companies, they had a very low score on Q30 – international patents – which may indicate some degree of technical unpreparedness. Trade and custom barriers Q33 and legal restrictions Q36 was also rather low, indicating lack of essential business information.

Following the initial statistical analysis, the authors analysed the data in search of patterns amongst the companies, which has led to the establishment of clusters in which the data behaved similarly. In this sense, a radar chart was created containing the number of common responses per construct in each cluster. It is possible that different clusters may demand different analysis and action plans to increase their means to surpass internationalization barriers. Figure 1 displays the behaviour of the companies analysed:





Data analysis showed that companies have a similar response profile in the survey questions, although it is also possible to identify specific clusters based on similar patterns of agreement. The results of Cluster 1, for instance, show that these respondents have significant homogeneity of responses, especially in the Strategic Management and Networking constructs. On Cluster 2, on the other hand, it is patent that agreement is more related to Operational Barriers and External Barriers. Cluster 3 presents a lesser level of agreement regarding networking.

Those clusters should be analysed on their own, as to determine if there are further patterns or common elements that may lead to specific readings about those companies' realities when facing internationalization barriers.

Notwithstanding the different cluster values, there is homogeneity amongst the companies, which may lead to some specific conclusions:

- The construct related to external barriers proved to be the most problematic, with the worst ranking amongst companies, demonstrating the need for further technical



preparation, networking development and medium and long-term internationalization strategies.

- Networking is overall deficient, despite some isolated positive scores, there does not seem to exist a strategy to maximize the networking, only isolated efforts.
- The construct related to operational barriers is the most positive, but the responses may be biased since most companies take the internal market as a reference.

5 CONCLUSION

The present article aimed at determining the main barriers to the internationalization of technology-based SMEs in the state of Rio Grande do Norte/Brazil in order to analyse potential strengths and weaknesses that may lead to the development of adequate strategies to support these organizations.

To that end, the authors first embarked in the study of the relevant literature about internationalization and its barriers, it was noticed that the internationalization process comprehends several precepts that can guide entrepreneurs and other stakeholders involved in the international expansion of technology-based SMEs, whether it occurs gradually in companies with a traditional business model or earlier on in companies with advanced scalability – *born globals* and start-ups:

- *Pari passu* to the advance of globalization, the understanding that internationalization is no longer an option and has become a strategic need for survival has become the norm, including for SMEs.
- Internationalization is a rational and planned process; it occurs through the interrelation between external and internal driving forces; thus, the planning of this process requires a strategic plan that incorporates these factors, maximizing opportunities and mitigating risks.
- For SMEs in particular, the personal characteristics of their leaders as well as their natural disposition to pursue internationalization are vital aspects to overcome the initial barriers.





- The barriers to the internationalization process are diverse and multifaceted, but can be summarized into four major constructs based on content analysis of relevant scientific literature: i) strategic management barriers (lack of mission, vision and strategic orientation, low entrepreneurial orientation and lack of leadership); ii) networking barriers (failures in the connection between the company and its stakeholders, often exacerbating the effects of other barriers); iii) internal and management barriers (lack of financial resources, low use of human capital, technical restrictions, low competitiveness); and iv) external barriers (political, economic, social, environmental and cultural).

Once the data about the companies was analysed, it is possible to make the following inferences about the internationalization barriers faced by technology companies in the state of Rio Grande do Norte:

- Despite the fact that the managers have educational background and overall inclination to lead the internationalization process of these companies, they have few or no experience, which may hinder the internationalization process.
- It was noticed a lack of overall strategic planning, internationalization initiatives seem to be dispersed, which suggests lack of leadership towards the internationalization goals.
- There is no planned networking resulting in difficulties for the companies to expand internationally.
- The external barriers are not properly addressed by the entrepreneurs/managers; there is a general lack of risk mitigation planning and unsatisfactory knowledge management.

It is suggested by the authors that further studies are pursued; firstly it is necessary to expand the present study to a larger number of companies in order to analyse how the data will behave. Secondly, it is vital to study how successful internationalized SMEs managed to surpass those barriers in order to create a set of best practices that can guide entrepreneurs and managers. Lastly, it is very relevant to compare the internationalization





patterns of companies in different regions or different industry sectors in order to identify new clusters that can be mapped and understood.

Regarding its limitations, the present work has methodological and conceptual restrictions:

- Methodologically it was challenged by the small number of companies that were studied as well as by the fact that the sample analysed was non-probabilistic, thus being necessary to expand its scope. Given such a small universe, some of the current information may be rather perishable and prone to change significantly in a short time.
- Conceptually, it faces the fact that the literature on internationalization barriers tends to have a regional focus, so the concepts, principles and information obtained may not necessarily be applied to the local reality.

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