

UNIVERSITY OF SÃO PAULO
POLYTECHNIC SCHOOL

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Towards an understanding of corporate-startup engagement:
the outcomes of corporate accelerators

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**Towards an understanding of corporate-startup engagement:
the outcomes of corporate accelerators**

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Dissertation presented to the Polytechnic School of
the University of São Paulo to obtain the title of
Master of Science.

Concentration area: Production Engineering

Advisor: Prof. Dr. Mario Sergio Salerno

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*In memory of my father, Emilio Carlos
Marciano, for everything he taught me.*

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RESUMO

O engajamento com startups tem se tornado uma prática de inovação aberta cada vez mais utilizada por grandes corporações para acelerar o desenvolvimento de seus negócios. Com essa tendência crescente, surgiram nos últimos anos diferentes modelos de engajamento entre essas empresas. Com o objetivo de mapear e sintetizar o atual conhecimento acadêmico acerca do tema e identificar oportunidades para novas pesquisas, foi realizada uma revisão semi-sistemática da literatura existente. A partir de seus resultados, foi possível observar que estudos anteriores focaram principalmente na tipologia e nas operações desses diferentes modelos de engajamento, assim como nas características e implicações do relacionamento entre as corporações e as startups. Com a revisão, também foi possível identificar lacunas de conhecimento que indicam oportunidades para o maior desenvolvimento do tema. Dentre essas oportunidades, esse projeto de pesquisa buscou aprofundar o conhecimento sobre as aceleradoras corporativas de startups, em especial no que se refere aos resultados que grandes corporações alcançam a partir dessas iniciativas, assim como os métodos que essas empresas utilizam para mensurar o valor que esses programas adicionam às suas organizações. Para entender melhor essas duas questões, foi realizado um estudo de múltiplos casos com 4 grandes corporações que se relacionam com startups através de aceleradoras corporativas. A partir de observações participativas, análises de documentos primários e secundários, e entrevistas com representantes das grandes empresas estudadas, foi possível constatar que empresas estabelecidas alcançam diferentes resultados com essas iniciativas, incluindo impactos positivos em níveis estratégicos, operacionais e organizacionais. Também foi possível constatar que essas corporações utilizam diferentes métodos para avaliar os resultados gerados com essas iniciativas, fazendo uso de indicadores quantitativos e avaliações qualitativas para avaliar esses impactos. Essas descobertas colaboram para a expansão do conhecimento acadêmico e prático sobre o engajamento entre grandes corporações e startups.

Palavras-chave: Aceleradoras Corporativas; Inovação Aberta; Startups.

ABSTRACT

The engagement with startups has become an increasingly open innovation practice employed by large corporations to accelerate the development of their businesses. With this uptrend, many corporate-startup engagement models have emerged over the recent years. Aiming to detect and synthesize the existing academic knowledge on the topic, and identify opportunities for further research, a semi-systematic literature review was performed. The results showed that the existing literature has mainly focused on the typology and operations of different corporate-startup engagement models, as well as on the characteristics and implications of the corporate-startup relationships themselves. With the review, it was also possible to identify many opportunities for further research on the subject. Amongst these opportunities, this research project focused on understanding the outcomes that large corporations achieve with corporate accelerators, as well as on how these companies measure the value that these initiatives add to their organizations. To answer these questions, a multiple case study was conducted with 4 large corporations engaging with startups through corporate accelerators. Based on participant observations, analyses of archival data, and semi-structured interviews with representatives from the established firms studied, it was possible to observe that incumbent companies achieve diverse outcomes with this corporate-startup engagement model, including benefits on a strategic, operational, and organizational level. It was also possible to identify that corporations employ several methods to measure the value that these initiatives add to their organizations, including quantitative indicators and qualitative assessments. The findings of this research contribute to the expansion of the academic and practical knowledge on corporate-startup engagement.

Keywords: Corporate Accelerators; Open Innovation; Startups; Corporate-Startup Engagement.

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1 INTRODUCTION

Over the last few decades, many large established companies have failed to sustain their positions when faced by technological or market changes. Emblematic cases include Kodak, Blockbuster and Nokia (Doz & Wilson, 2017; Gershon, 2013; Lucas Jr. & Goh, 2009). These episodes raise a question about why some well-managed companies, that are leaders of their markets and constantly invest in new technologies, fail. According to Christensen (1997), the cause is related to the innovator's dilemma, which states that established firms often fail because the very managing practices that led them to success also make it very difficult for them to develop the innovations that will disrupt their markets.

Literature highlights different strategies to avoid the innovator's dilemma and to support the development of radical innovation in large companies. Some scholars advise the creation of spin-offs focused on the development of disruptive innovations in order to escape from internal managerial and learning barriers (Christensen, 1997; Hill & Rothaermel, 2003). Others advocate the creation of radical innovation hubs inside the corporations, reporting that they can reduce the uncertainties surrounding radical projects without increasing bureaucracy (Leifer, O'Connor & Rice, 2001). Finally, there are those who state that open innovation initiatives can accelerate the discovery and learning processes needed to develop radical projects, shorting the development cycle and increasing the sustainability of radical innovation hubs in established firms (O'Connor, 2006).

The open innovation concept is defined by Chesbrough (2006) as a paradigm that declares that organizations can and should use external and internal sources of knowledge, as well as external and internal paths to market in order to accelerate internal innovation and capture value for their businesses. In regard to large companies, it is possible to observe many successful open innovation partnerships involving them in the literature, where they cooperate with universities and research institutions (Perkmann & Walsh, 2007), users and consumers (Lettl, Herstatt, & Gemuenden, 2006), suppliers (Emden, Calantone, & Droge, 2006), partners from other industries (Enkel & Gassmann, 2010) and even competitors (Gnyawali & Park, 2011).

Literature also shows that there is an uptrend of large corporations engaging with startups to enhance corporate innovation (Weiblen & Chesbrough, 2015). For this engagement to occur, established firms employ different corporate-startup engagement models, such as corporate venture capital (Chesbrough, 2002), startup acquisitions (Ferrary, 2011), corporate accelerators (Kohler, 2016), platform startup programs (Weiblen & Chesbrough, 2015), startup contests (Schaeffer, 2015) and startup supplier programs (Kurpjuweit & Wagner, 2020).

Among these corporate-startup engagement models, corporate accelerators are the ones that have received most attention in academia recently, with the number of academic publications about them growing considerably. Previous investigations on corporate accelerators have focused mainly on their design and key features (Ben Mahmoud-Jouini, Duvert, & Esquirol, 2018; Connolly, Turner, & Potocki, 2018; Kohler, 2016; Kupp, Marval, & Borchers, 2017; Richter, Jackson, & Schildhauer, 2018; Shankar & Shepherd, 2019), on their typology (Kanbach & Stubner, 2016; Moschner, Fink, Kurpjuweit, Wagner, & Herstatt, 2019) and on their benefits and challenges (Gutmann, Kanbach, & Seltman, 2019; Urbaniec & Żur, 2020). While these studies contribute towards an understanding of this corporate-startup engagement model, they still present limitations for a complete comprehension of the outcomes that established firms can achieve through these initiatives.

Gutmann et al. (2019) explored the benefits of the SAP corporate accelerator from both the corporate and the startups perspective. Although the study shed light on the outcomes that the German multinational software corporation achieved with the initiative, it was limited to this case only, demanding for broader research regarding companies from different regions and industries. Urbaniec and Żur (2020) also provided evidence on the benefits that Polish established firms achieve when engaging with startups through accelerators. However, their study also offered some opportunities for further research, such as analyzing companies from different countries to check if the results achieved are similar, as their investigations were focused on firms based in Poland only.

Besides the limitations regarding the outcomes that corporations can achieve with accelerator programs, previous research highlighted that there is also a lack of knowledge

about how established firms can evaluate the value that these initiatives generate to their organizations (Ben Mahmoud-Jouini et al., 2018; Gutmann et al., 2019). This is an essential element for the sustainability of the accelerators, as transparency about added value is highly important in large companies (Kanbach & Stubner, 2016). Therefore, this research project aims to address these knowledge gaps by clarifying the following research questions:

RQ1: What outcomes do large corporations achieve when engaging with startups through corporate accelerator programs?

RQ2: How large corporations measure the value that corporate accelerators add to their organizations?

To answer these questions, this research project relied on a multiple case study conducted with 4 large corporations engaging with startups through corporate accelerators. At the end of the study, it is expected that the findings contribute to the development of the academic knowledge on the topic.

This research project is structured in 7 chapters. Besides **Chapter 1**, which introduces the research to be presented, **Chapter 2** presents the literature review conducted on the engagement between large companies and startups, introducing the main themes addressed by previous studies, their main findings, and their limitations. **Chapter 3** presents the methodology of this research project, including the formulation of the research questions, the conceptual framework, the research protocol, the case selection procedure, and the methods applied for collecting and analyzing the data. **Chapter 4** describes the case studies realized with four large corporations engaging with startups through corporate accelerators, as well as it presents the individual and cross-case analyses of the cases. On **Chapter 5**, the main findings of the multiple case study are presented. Following that, **Chapter 6** discusses these main findings with regards to previous research, presents its academic and practical implications, addresses its limitations, and recommends directions for future research. Finally, **Chapter 7** presents the conclusion thoughts of this research project.

2 LITERATURE REVIEW

This chapter presents the outcomes of a semi-systematic literature review on the engagement between large corporations and startups. It synthesizes the existing academic knowledge relating to this subject and introduces opportunities for further research on the topic.

The review is presented in three sections. The first introduces the literature review methodology employed for planning, conducting, analyzing, and reporting the review. The second presents the review report, comprising descriptive and thematic analyses of the relevant papers and directions for further research. The last section concludes the review with a reflection on its main objectives.

2.1 Methodology of the literature review

A semi-systematic literature review (SSLR) methodology was chosen in order to evaluate the existing academic knowledge on the engagement between large corporations and startups and to identify opportunities for further research within the topic. SSLR are useful to detect and synthesize the state of knowledge within a research discipline, as well as to create an agenda for further research on a specific subject (Snyder, 2019).

Based on Snyder (2019) and Tranfield, Denyer and Smart (2003), an eight-steps methodology was employed to conduct this SSLR. These steps comprised the definition of the review objectives, the development of the search strategy, the identification of previous research on the topic, the selection of the relevant papers for the review, the data extraction and structuring, the data synthesis and analysis, the report of the main results and the conclusion of the review (see *Figure 1* for the full method). The following sections will describe each of these steps in more detail.

2.1.1 Step1: Definition of the review objectives

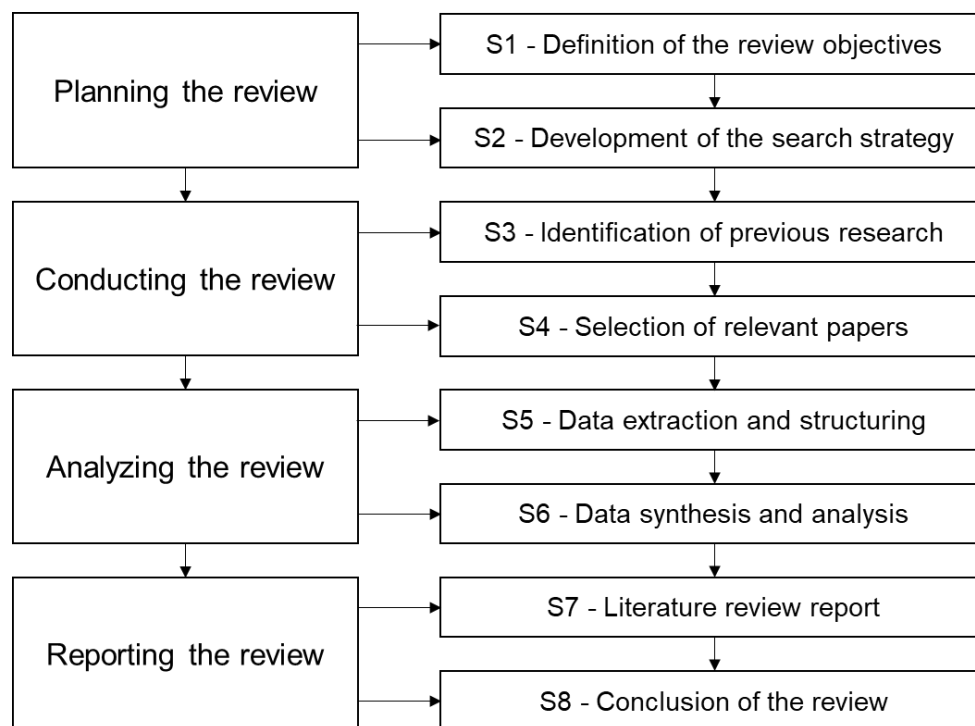
Defining clear review objectives is essential for conducting any literature review. It helps to define the approaches to be employed, as well as to assess if the review is being

conducted accordingly. For this SSLR, two main review objectives were defined with regards to the engagement between large corporations and startups:

RO1: To identify and synthesize the existing literature on the engagement between large corporations and startups.

RO2: To identify opportunities for further research on the engagement between large corporations and startups.

Figure 1 - Methodology of the semi-systematic literature review



Source: Author, based on Snyder (2019) and Tranfield et al. (2003)

2.1.2 Step 2: Development of the search strategy

The search strategy in a SSLR comprises the selection of the appropriate databases which data will be collected, the definition of the search terms and search string that will be used to search the databases, and the elaboration of the inclusion and exclusion criteria that will be employed to identify the literature that is actually relevant considering the objectives of the review (Snyder, 2019).

2.1.2.1 Selection of the databases

The author selected the Elsevier's Scopus and the Clarivate Analytics' Web of Science databases to identify the data for this semi-systematic literature review. According to Aghaei Chadegani et al. (2013), these databases are the two most extensive databases for academic research.

2.1.2.2 Definition of the search terms and search string

To define the search terms and string to search the databases, the author first explored how other scholars referred to the subject under research in previous studies. For that, he analyzed the title, abstract and keywords of the most cited articles resulted from a search of the words "corporation*" and "startup*" in the Clarivate Analytics' Web of Science database.

By analyzing the data, the author found that the words "company", "firm", "industry" and "enterprise" were constantly employed in literature as synonyms of "corporation". The author also identified that these words were generally preceded by the adjectives "large", "established" or "incumbent" in the literature. Therefore, these variations and combinations were considered to the SSLR search string.

The analysis also revealed that the spelling variation of the word startup "start-up" was used by some scholars, so it was also included in the search string of this SSLR. Finally, the terms "corporate accelerator" and "corporate innovation" were also added to the string, since they were frequently mentioned in the papers. The final search string built from this exploration can be seen below.

Literature review search string

```
((“startup*” OR “start-up*”) AND (“large compan*” OR “large corporat*” OR “large firm*”
OR “large industr*” OR “large enterpri*” OR “established compan*” OR “established corporat*”
OR “established firm*” OR “established industr*” OR “established enterpri*” OR “incumbent
compan*” OR “incumbent corporat*” OR “incumbent firm*” OR “incumbent industr*” OR
“incumbent enterpri*” OR “corporate accelerator*” OR “corporate innovation*”))
```

Source: Author

2.1.2.3 Elaboration of the inclusion and exclusion criteria

Inclusion and exclusion criteria were created to identify the relevant data for this review (see *Table 1 and Table 2*). The logic adopted was to include all the theoretical and empirical studies focusing on the engagement between large corporations and startups in the established firms' point of view. As the term startup is often used in papers to refer to corporate spin-offs or internal corporate agile teams, exclusion criteria were introduced to exclude these papers systematically, as well as those focusing on the simple comparison between the characteristics of incumbent companies and startups.

Table 1 - Inclusion criteria

| ID | Inclusion Criteria | Reason for Inclusion |
|-----------|--|---|
| 1 | Theoretical papers or empirical studies | To explore previous theories and capture all the existing empirical evidence |
| 2 | Any study that focuses on large corporations and considers the engagement between them and startups at least as an aspect of the study | To investigate engagement between large corporations and startups from the point of view of the established firms |

Source: Author

Table 2 - Exclusion criteria

| ID | Exclusion Criteria | Reason for Exclusion |
|-----------|--|--|
| 1 | Focus on corporate spin-offs | Startups derived from large corporations do not collaborate for the purpose of this research |
| 2 | Focus on internal corporate teams | Internal corporate teams working in startup mode do not collaborate for the purpose of this research |
| 3 | Focus on the simple comparison between large corporations and startups | The simple comparison between the different characteristics of large corporations and startups does not collaborate for the purpose of this research |

Source: Author

2.1.3 Step 3: Identification of previous research

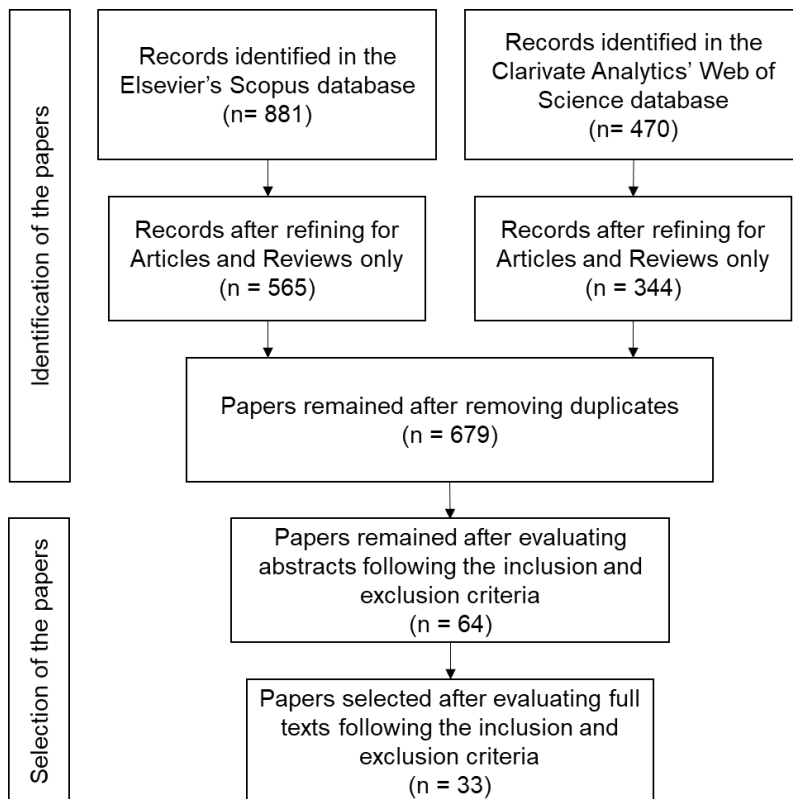
The search string presented in *Step 2* was applied to the title, abstract, and keywords fields of the Elsevier's Scopus and the Clarivate Analytics' Web of Science databases. The initial search returned 881 records in Scopus and 470 in Web of Science.

To analyze only peer-reviewed and completed studies, the document type's field of this initial search were then set to include only articles and reviews. With this setting, 565 records remained in Scopus and 344 in Web of Science. After the exclusion of duplicate records, 679 publications stayed on for evaluation.

2.1.4 Step 4: Selection of the relevant papers

The selection of the relevant papers for this literature review was carried out in two stages. First, the abstracts of each of the 679 remained publications were evaluated according to the inclusion and exclusion criteria. After this first evaluation, only 64 papers remained to be fully evaluated. The second step of the selection process comprised the full text evaluation of the 64 remained papers to make sure that they met all the inclusion criteria and none of the exclusion criteria specified. After this last stage, 33 papers were selected to be reviewed. *Figure 2* illustrates the complete process of the identification and selection of the papers.

Figure 2 - Identification and selection process of the reviewed papers



Source: Author

2.1.5 Step 5: Data extraction and structuring

To reduce human error and bias, systematic reviews use data-extraction forms to structure the data collected (Tranfield et al., 2003). The data-extraction form of this review comprised general information about the papers, such as author and publication details, as well as study features, such as the research approach and methods. It also included notes on the main topics covered by each paper, as well as their key results and contributions.

With this structured data-extraction form, the author iteratively reviewed the 33 selected papers until all the necessary data were extracted. See *Appendix A* for the data-extraction report of each of the papers reviewed.

2.1.6 Step 6: Data synthesis and analysis

With the structured data of each reviewed paper, a synthesis of the overall collective data was performed. This synthesis included a descriptive analysis of the papers regarding their year of publication, their research approach, their data collection methods, their research nature, and their research design. It also comprised a thematic analysis of the reviewed articles, which focused on summarizing the main themes under research on the engagement between large corporations and startups.

2.1.7 Step 7: Literature review report

A four-stage report was produced to summarize the results of this semi-systematic literature review. Following the data analysis performed in *Step 6*, the report first introduced the descriptive analyses completed with the collective data of the reviewed papers. Then, it presented a synthesis of the literature on the engagement between large corporations and startups following the thematic analysis performed. This three-stage report will be presented in *Section 2.2*.

2.1.8 Step 8: Conclusion of the review

The last step of this SSLR focused on concluding the literature review by reflecting on the review objectives defined in *Step 1*. This conclusion is presented in *Section 2.3*.

2.2 Literature review report

This report presents the main results of the literature review conducted on the engagement between large corporations and startups. It features descriptive and thematic analyses of the 33 reviewed papers, as well as indicates opportunities for further research.

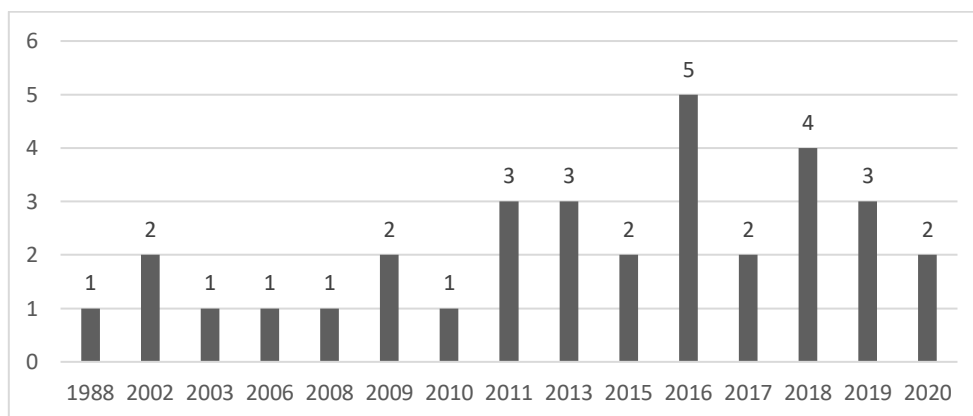
2.2.1 Descriptive analyses of the reviewed papers

This section features different descriptive analyses of the reviewed papers, including the historical evolution of the publications, the research approach and nature of the studies, and the data collection and analysis methods employed by previous scholars.

2.2.1.1 Historical evolution of publications

Results from the literature review show that there was only one relevant paper addressing the engagement between large corporations and startups before the 2000s, with a study exploring the advantages of strategic alliances for established firms published in 1988. Since then, the second relevant article included to this literature review was only published in 2002. During the 2000s, 7 relevant papers were published, showing a greater interest to the subject. However, it was only after 2011 that publications on the topic began to grow, reaching their peak in 2016 with the first publications focused on corporate accelerators. *Figure 3* presents the complete distribution of the reviewed papers per year of publication.

Figure 3 - Distribution of papers per year of publication



Source: Author

2.2.1.2 Research approach of the reviewed papers

In 21 out of the 33 articles analyzed (64%), an exploratory research approach was employed to further understand the subject under research, generating hypotheses through the analyses of the data collected. Only 5 papers made use of confirmatory approaches by testing past theories and hypotheses (15%). In 7 papers, the research approach was not clear (21%).

The high utilization of exploratory approaches leads to the conclusion that the academic knowledge on the engagement between large corporations and startups was recent at the time the studies were conducted. See *Table 3* for the synthesis of the research approaches found in the literature review.

Table 3 - Synthesis of the research approaches found in the literature review

| Research approach | Nº of papers | Distribution |
|--------------------------|---------------------|---------------------|
| Exploratory | 21 | 64% |
| Confirmatory | 5 | 15% |
| Not clear | 7 | 21% |

Source: Author

2.2.1.3 Research nature of the reviewed papers

Regarding the nature of the analyzed papers, 25 were categorized as empirical studies (76%), 1 as a theoretical paper (3%) and in 7 nature was not clear (21%). *Table 4* synthesizes the distribution of the papers regarding the nature of the research.

Table 4 – Synthesis of the research nature of the reviewed papers

| Nature of the research | Nº of papers | Distribution |
|-------------------------------|---------------------|---------------------|
| Empirical | 25 | 76% |
| Theoretical | 1 | 3% |
| Not clear | 7 | 21% |

Source: Author

2.2.1.4 Data collection methods employed by previous authors

In 20 out of the 33 papers analyzed, scientific data and information have primarily been collected through semi-structured interviews (61%), in 4 data have mainly been

gathered from databases (12%) and in one data have been extracted from a survey (3%). Finally, one paper based the research on game theory (3%) and in 7 the method used for collecting data was not clear (21%). See *Table 5* for the synthesis of the data collection methods employed.

Table 5 – Synthesis of the data collection methods employed in the reviewed papers

| Data collection method | Nº of papers | Distribution |
|-------------------------------|---------------------|---------------------|
| Semi-structured interviews | 20 | 61% |
| Database | 4 | 12% |
| Survey | 1 | 3% |
| Game theory | 1 | 3% |
| Not clear | 7 | 21% |

Source: Author

As most of the papers have made use of interviews to collect information (61%), while only 12% had the opportunity to obtain data from structured databases, it is possible to conclude that structured data regarding the engagement between large corporations and startups is scarce.

2.2.1.5 Data analysis methods employed in the reviewed literature

With regards to the data analysis methods, 19 out of the 33 papers employed a qualitative method for analyzing the research data (58%), 5 employed a quantitative methodology (15%), and 2 combined both qualitative and quantitative methods for analyzing the data (6%). As the other categories, for 7 articles the data analysis method was not clear (21%). The synthesis of the data analysis methods utilized in the papers analyzed can be seen in *Table 6*.

Table 6 - Synthesis of the data analysis methods utilized in the papers analyzed

| Data analysis method | Nº of papers | Distribution |
|-----------------------------|---------------------|---------------------|
| Qualitative | 19 | 58% |
| Quantitative | 5 | 15% |
| Both | 2 | 6% |
| Not clear | 7 | 21% |

Source: Author

2.2.2 Thematic analysis of the reviewed literature

This section presents a thematic analysis of the 33 reviewed papers regarding the engagement between large corporations and startups. It summarizes the academic knowledge on the topic by identifying the main themes addressed by previous research, as well as the main subjects within these themes.

2.2.2.1 Theme 1: Corporate-startup engagement models

Corporate-startup engagement models can be defined as the structured and systematic approaches that large companies employ to engage with startups. The literature review revealed that corporations engage with startups through different models, including (1) corporate venture capital (Chesbrough, 2002), (2) startup acquisitions (Ferrary, 2011), (3) corporate accelerators (Kohler, 2016), (4) platform startup programs (Weiblen & Chesbrough, 2015), (5) startup contests (Schaeffer, 2015) and (6) startup supplier programs (Kurpjuweit & Wagner, 2020). The definition of each of these models and the reviewed studies related to each of them will be presented in the next sections.

2.2.2.1.1 Model 1: Corporate venture capital

Corporate venture capital (CVC) is defined as the direct investment of corporate funds in external startups (Chesbrough, 2002). Unlike independent venture capitals, CVCs do not only seek financial returns, but also support their parent company's strategic goals by backing startups that offer complementary products and services to its businesses (Weiblen & Chesbrough, 2015). Chesbrough (2002) stated that CVC investments can be classified by its objective, whether it is strategic or financial, and by the degree to which the operations of the invested startup is linked to the parent company's current operational processes and resources. According to the author, there are four types of corporate VC investments:

- a) enabling, which complements the strategy of current business;
- b) driving, which helps corporations advance the strategy of current business;
- c) emergent, which allows exploration of potential new businesses;
- d) passive, which is focused on financial returns only.

The reviewed literature focusses on two main aspects when discussing about corporate venture capital:

- a) the operations and challenges of CVC units;
- b) the outcomes of CVC activities for large companies.

Regarding the operations of corporate venture capital units, Chesbrough (2002) presented a framework that can help large companies decide if it should invest in a particular startup by evaluating the benefits that might come from the investments. Lerner (2013) listed six steps to help corporations succeed in CVC activities. Aernoudt and San José (2003) analyzed how large companies invest, the size of their investments, their importance in the funding chain and what can be done to increase their role in the seed investment of startups. Lantz, Sahut and Teulon (2011) analyzed different types of CVC to assess what increase the value creation for the invested projects. Napp and Minshall (2011) interviewed managers of nine CVC units to analyze the challenges surrounding corporate venture capital units and presented practical solutions drawn from the case studies. They also observed that parent firms assess several open innovation success metrics to track its performance, including qualitative and quantitative financial and nonfinancial measures.

Michalski, Nafe and Usein (2006) presented a quantitative study of the success factors of corporate venturing based on the resource-based view and competence-based view literatures. They discovered that cooperation with traditional venture capital companies, sufficient scope for independent decision-making and political support from the top management influences in a positive way the success of corporate venturing activities. Basu, Phelps and Kotha (2016) conducted a study with 17 CVC units to understand how them effectively search for valuable external venture partners and integrate their initiatives with mainstream organizational units. From their findings, they proposed a framework that contemplates the search and integration processes used CVC units. Finally, Mohamed and Schwienbacher (2016) conducted a quantitative investigation of the drivers and outcomes of corporate venture capital investment announcements to assess the strategy of corporations on voluntary information disclosure. They found that announced investments positively affect the stocks of parent companies.

When it comes to the benefits and outcomes of corporate venture capital for large companies, Benson and Ziedonis (2009) presented a quantitative analysis of how information gained through CVC investing might improve the large company's acquisition performance. They found that corporations with more stable CVC programs earn greater returns when acquiring startups when compared to companies with more sporadic investment programs. Based on a game theory of an optimal organization and financial structures in the context of R&D competition, Fulghieri and Sevilir (2009) concluded that companies organizing their projects externally by financing startups can obtain competitive advantage over their rivals. Lastly, Smith and Sfekas (2013) analyzed the contribution of invested physician-founded startups to incumbent medical device manufacturers. Their study shows that the engagement between large medical device companies and startups positively influences patenting and product market innovation.

2.2.2.1.2 Model 2: Startup acquisitions

If corporate venture capital units focus on small equity investments in startups, acquisitions consist in the full purchase of a younger venture by a larger company. The two reviewed articles that addressed this model focused on the influence of the acquisitions on the innovation output of established firms.

The first paper, Ferrary (2011), presented a longitudinal comparative study of the innovation strategy of two large corporations from the telecommunication equipment industry, Lucent Technologies and Cisco Systems. The first is a case of an ambidextrous organization that invests important financial resources into exploration through its internal research and development unit. The second focuses on a strategy of outsourcing exploration through the acquisition and development of high-tech startups. The study analyzed the financial reports of both companies over fifteen years and suggests that companies that outsources exploration through the acquisition of startups and specialize in exploitation (Cisco) might have competitive advantage over ambidextrous firms (Lucent Technologies).

The second article, Kleer and Wagner (2013), conducted a confirmatory study about the effects of firm acquisitions on the innovation output of incumbent companies.

Their research suggests that acquisitions indeed improve the overall innovation output of established companies, especially those acquisitions that have a technological background. It also indicates that the number of acquisitions is higher in industries with larger competitive heterogeneity between large corporations and small startups.

2.2.2.1.3 Model 3: Corporate accelerators

Corporate accelerators are defined as programs of limited duration that support cohorts of startups through mentoring, education, and corporation's specific resources (Kohler, 2016). Moreover, many programs provide free co-working spaces to the startups, as well as access to a vast network of contacts. According to Kanbach and Stubner (2016), some corporate accelerators also offer to invest in the startups in exchange of an equity stake, which is transferred either directly by giving shares to the parent company or through convertible loans that convert into equity at future financing rounds. Finally, the programs usually culminate in a grand ceremony, common called "demo day", a pitch event for potential investors, media and executives from the supporting firm (Kohler, 2016).

The assessed literature mainly emphasized on four themes when analyzing corporate accelerators:

- a) the typology of different types of corporate accelerators;
- b) the operations and success factors for running these programs;
- c) the challenges associated with this model;
- d) the benefits generated for large companies.

Regarding the typology, Kanbach and Stubner (2016) stated that there are four different models of corporate accelerators. They came to this conclusion after analyzing the objectives and configurations of 13 acceleration programs in Germany. The four distinct types are:

- a) listening post: this type of corporate accelerator has a fully strategic orientation without any direct financial objective. The main purpose of this

model is to gain insights on a particular market or industry and initiate cooperative relationships with startups working in these areas;

- b) value chain investor: this accelerator aims to identify, develop and integrate startups with innovative products and services that can benefit somewhere along the large company's value chain. According to the authors, investments in exchange of equity in the startups are obligatory in this model to guarantee access to the technologies and to strengthen cooperation between the two parties;
- c) test laboratory: the objective of this model is to provide a protected environment for new business ideas to be tested. Unlike the other examples, the test laboratory does not focus exclusively on external startups, but also on promising internal corporate ideas that can be accelerated with the collaboration of external startups. Equity investments in this corporate accelerator is frequent;
- d) unicorn hunter: unlike all other models, this corporate accelerator has mainly financial objectives. Its main purpose is to earn financial returns through several minority equity investments in startups. Therefore, many invested startups are not directly related to the core business of the parent companies.

Moschner et al. (2019) also indicated that there are four different types of corporate accelerators. In their study, they differentiate the models by their management structure, classifying them as:

- a) in-house accelerator: an accelerator program that is fully created and operated internally by the large company;
- b) hybrid accelerator: also refers to accelerator programs that are created and operated internally by the corporation, with the addition of not just developing opportunities with external startups, but also developing internal innovation projects carried by corporate employees;

- c) powered by accelerator: a model where an independent external accelerator manages the program on behalf of a single large company;
- d) consortium accelerator: a model where an independent external accelerator manages the program on behalf of several corporations.

Concerning the operations and success factors for corporate accelerators, Kohler (2016) proposed a framework that contemplates the main strategies for designing the programs. It describes best practices for defining the proposition, designing the process, involving the right people and even deciding about the place where the program will be hosted. Richter, Jackson and Schildhauer (2018) presented an analysis of the key features of corporate accelerators, including strategy, resources, procedures, structure, roles, environment and metrics. Mahmoud-Jouini, Duvert and Esquirol (2018) studied the key factors in building a corporate accelerator capability. They found that designing a differentiated value proposition for attracting good startups and developing a specific process to manage the relationship between the large companies and the startups are critical factors for the success of the programs. Kupp, Marval and Borchers (2017) also focused on the success factors for running corporate accelerators. Connolly, Turner and Potocki (2018) presented an analysis of the operations of a corporate agribusiness accelerator. At last, Shankar & Shepherd (2019) studied the structure and processes of two different types of corporate accelerators, namely accelerating strategic fit and accelerating venture emergence.

In terms of challenges, Urbaniec and Żur (2020) identified in their research on Polish corporate accelerators that established companies face several challenges when running this kind of corporate-startup engagement model, such as human capital limitations related to their own employees, management practice limitations due to the novelty of the experience and asymmetries in the relationship with the startups. Regarding the last, Jackson and Richter (2017) conducted a study that revealed that there are ideational and material conflicts between corporations and startups. The first concerns to differences in beliefs and cultural aspects, which arises when there is a deep contradiction at the level of ideas. The second regards the divergences in the interests of both parties,

which occurs when they compete for the same resources or for different material outcomes.

With regards to the benefits of corporate accelerators, Gutmann, Kanbach and Seltman (2019) explored the advantages perceived by SAP – a German software development corporation – with its startup acceleration program, which highlighted gains in product development, brand development, corporate culture and in customer relationship development. Urbaniec and Żur (2020) also studied the benefits of this corporate-startup engagement model as part of their broader research on Polish accelerator cases. They identified advantages in new knowledge acquisition, human capital development, network development and enhancements of corporate image.

2.2.2.1.4 Model 4: Platform startup programs

In this corporate-startup engagement model, large companies provide access to their technologies through platforms so startups can build their products using them. This strategy allows corporations to strengthen their platforms and expand their markets with the startups, an inside-out approach (Weiblen & Chesbrough, 2015).

The only scholars to study platform startup programs in the literature review were Weiblen and Chesbrough (2015). They analyzed the cases of Startup Focus, a platform from SAP that provides big data tools for startup developers, and Startup Blueprint, a platform from PayPal that offers payment solutions for startups. From interviews with executives of both programs, they found that clarity about the revenue model of the platform and capability to handle several collaborating startups simultaneously are essential to succeed in this model.

2.2.2.1.5 Model 5: Startup contests

Startup contest is an open innovation tool used by large companies to detect innovations developed outside the firm and to meet future partners. It consists in established corporations listing themes within a technological or market area and publicly asking for startups to propose solutions which are in the development stage or already existing innovations (Schaeffer, 2015).

Schaeffer (2015) was the only researcher to explore this model in the reviewed literature. She analyzed the cases of eight startup contests organized by large companies in France to understand the outcomes of the practice. She found that established corporations perceive three main benefits when making use of this tool:

- a) an increase in the entrepreneurial potential of the firm;
- b) a reduction in the risks associated with the fuzzy front end of innovation;
- c) a reduction of time to market.

2.2.2.1.6 Model 6: Startup supplier programs

Startup supplier programs are a more recent corporate-startup engagement model that focuses on selecting, integrating, and developing startups as suppliers to incorporate innovations that can increase corporations' competitiveness of products or productivity of processes. It usually consists in a stage-gate process of 4 gates, including the identification of attractive startups, the internal matchmaking of the startups identified with the business units, the development of a pilot project between both parties and the transfer of the startup into the established firms' supply base (Kurpjuweit & Wagner, 2020).

Kurpjuweit and Wagner (2020) were the only scholars found in the literature review to study startup supplier programs. They suggested that this new type of corporate-startup engagement model can be more effective than other startup initiatives regarding the integration of innovations into firm's core business, since it focuses exclusively on the innovation transfer part of the relationships. Moreover, they stated that this is an effective initiative to complement, integrate and reinforce other startup collaborating models, such as corporate accelerators or corporate venture capital units.

2.2.2.2 Theme 2: Characteristics of the corporate-startup relationships

Some of the reviewed papers addressed the collaboration between large corporations and startups without linking it to any particular corporate-startup engagement model. They focused on the characteristics of the relationships themselves, exploring the role of strategic alliances, the particularities of asymmetric partnerships and the causes and effects of co-competition between established firms and startups.

Strategic alliances are defined as formal linkages between two companies which offer actual or promising strategic advantage to either or both parties (Olleros & Macdonald, 1988). Partnerships are described as asymmetric when there are significant differences in resources, capabilities and experience between the two organizations involved in the alliance, a common characteristic of the relationships between incumbent firms and young ventures (Minshall, Mortara, Elia, & Probert, 2008). Coopetition stands for the collaboration between competitors, in this case, established corporations and startups cooperating to create value, while simultaneously competing to capture part of that value (Hora, Gast, Kailer, Rey-Marti, & Mas-Tur, 2018).

2.2.2.2.1 Strategic alliances

Olleros and Macdonald (1988) analyzed the benefits for large companies engaging in strategic alliances, including examples between established enterprises and startups. They concluded that strategic alliances help incumbent firms to augment the responsiveness to opportunities, enhance the capacity of the organization to deal with risk and allow the corporation to enjoy greater strategic advantage from its resources. Rothaermel (2002) investigated how incumbent pharmaceutical companies go about selecting alliance partners from the population of new biotechnology startups. They discovered that these incumbents choose their partners mainly based on the startup's new product development, economies of scope, public ownership and location in a regional technological cluster.

2.2.2.2.2 Asymmetric partnerships

With regard to the asymmetric side of the alliances, Minshall, Mortara, Valli and Probert (2010) evaluated the common challenges surrounding corporate-startup asymmetric partnerships. They discovered that large firms have many concerns when collaborating with startups, including the management of intellectual property, the potential brand abuse by the young venture, the startup's lack of resources and financial stability and cultural differences. Based on case studies, the scholars also drawn management approaches to overcome these challenges, which are described both in Minshall et al. (2010) and Minshall et al. (2008). Hogenhuis, Van Den Hende and Hultink

(2016) proposed a decision-making model for collaborations with young ventures. The scholars suggested that large corporations should consider the status of the project on which they look for collaboration and the desired capabilities needed to make the project successful when searching for a new strategic partner.

2.2.2.2.3 Coopetition

Hora et al. (2018) conducted a qualitative study to understand the motives, the management and the implications of coopetitive activities between large companies and startups. They interviewed 35 executives of Austrian-based corporations and 35 founders of Austrian-based startups involved in coopetitive partnerships. Their research revealed that established firms coopeting with startups can benefit from gaining access to new technologies and market segments, as well as other complementary resources that can leverage their innovation capability. However, coopetition with startups also comes with the risk of failure. Many corporative executives interviewed revealed that the startup's lack of stability and experience might negatively affect the projects.

2.2.2.3 Synthesis of the thematic analysis

The thematic analysis showed that the existing literature on the engagement of large corporations and startups has mainly focused on the operations and outcomes of different corporate-startup engagement models, as well as on the characteristics of the corporate-startup relationships, addressing the asymmetric side of strategic alliances and the coopetition that might happen between both parties. *Table 7* synthesizes the thematic analysis carried out, displaying the main themes and subjects covered by each paper.

Table 7 – Synthesis of the thematic analysis of the reviewed papers

| Papers | Theme 1 Corporate-Startup Engagement Models | | | | | | Theme 2 Characteristics of Relationships | | |
|----------------------------------|--|----------------------|------------------------|---------------------------|------------------|---------------------------|---|-------------------------|-------------|
| | Corporate Venture Capital | Startup Acquisitions | Corporate Accelerators | Platform Startup Programs | Startup Contests | Startup Supplier Programs | Strategic Alliances | Asymmetric Partnerships | Coopetition |
| Aernoudt and San José (2003) | X | | | | | | | | |
| Basu et al. (2016) | X | | | | | | | | |
| Ben Mahmoud-Jouini et al. (2018) | | | X | | | | | | |
| Benson and Ziedonis (2009) | X | | | | | | | | |
| Chesbrough (2002) | X | | | | | | | | |
| Connolly et al. (2018) | | | X | | | | | | |
| Ferrary (2011) | | X | | | | | | | |
| Fulgieri and Sevilir (2009) | X | | | | | | | | |
| Gutmann et al. (2019) | | | X | | | | | | |
| Hogenhuis et al. (2016) | | | | | | | | X | |
| Hora et al. (2018) | | | | | | | | | X |
| Jackson and Richter (2017) | | | X | | | | | | |
| Kanbach and Stubner (2016) | | | X | | | | | | |
| Kleer and Wagner (2013) | | X | | | | | | | |
| Kohler (2016) | | | X | | | | | | |
| Kupp et al. (2017) | | | X | | | | | | |
| Kurpjuweit and Wagner (2020) | | | | | | X | | | |
| Lantz et al. (2011) | X | | | | | | | | |
| Lerner (2013) | X | | | | | | | | |
| Michalski et al. (2006) | X | | | | | | | | |
| Minshall et al. (2008) | | | | | | | | X | |
| Minshall et al. (2010) | | | | | | | | X | |
| Mohamed and Schvienbacher (2016) | X | | | | | | | | |
| Moschner et al. (2019) | | | X | | | | | | |
| Napp and Minshall (2011) | X | | | | | | | | |
| Olleros and Macdonald (1988) | | | | | | | X | | |
| Richter et al. (2018) | | | X | | | | | | |
| Rothaermel (2002) | | | | | | | X | | |
| Schaeffer (2015) | | | | | X | | | | |
| Shankar and Shepherd (2019) | | | X | | | | | | |
| Smith and Sfekas (2013) | X | | | | | | | | |
| Urbaniec and Zur (2020) | | | X | | | | | | |
| Weiblen and Chesbrough (2015) | X | | X | X | | | | | |
| Total Number of Papers | 12 | 2 | 12 | 1 | 1 | 1 | 2 | 3 | 1 |

Source: Author

2.2.3 Opportunities for further research

The analyses of the reviewed papers revealed that there are many opportunities for further research on the engagement between large corporations and startups. With regards to corporate-startup engagement models, Schaeffer (2015) suggested that it would be interesting to study the complementarity between different models for large corporations. For that, the outcomes of each model would have to be profound investigated to develop a consistent framework. From the results of this literature review, it was clear that some empirical studies about the benefits and challenges of the different models exist, but most of them still have limitations.

Regarding corporate accelerators, a broader research on the outcomes achieved by established firms through these initiatives and the methods they use to quantify the value that this programs add to their organizations would address the limitations highlighted by other scholars about this particular model (Ben Mahmoud-Jouini et al., 2018; Gutmann et al., 2019). For other models, such as platform startup programs (Weiblen & Chesbrough, 2015), startups contests (Schaeffer, 2015) and startup supplier programs (Kurpjuweit & Wagner, 2020), there are several knowledge gaps still to be filled. As each one had only 1 relevant paper found in the literature, it can be concluded that further studies are still needed to achieve scientific consensus. On the other hand, confirmatory investigations can give stronger support to some of the theories found in the literature, especially for more mature models, such as corporate venture capital and startups acquisitions (Benson & Ziedonis, 2009; Fulghieri & Sevilir, 2009; Kleer & Wagner, 2013).

Finally, it would be also interesting to discuss the characteristics of the different legal mechanisms mentioned in literature for establishing a formal relationship between large companies and startups, such as licensing agreements, convertible loans, joint development agreements and contract services (Kanbach & Stubner, 2016; Minshall et al., 2010; Napp & Minshall, 2011; Weiblen & Chesbrough, 2015).

2.3 Conclusion of the literature review

The main objectives of this literature review were to identify and synthesize the existing academic knowledge on the engagement between large corporations and startups, as well as to find opportunities for further research within the topic. For that, a semi-systematic literature review approach was employed to plan, conduct, analyze and report the review.

The report presented in *Section 2.2* indicated that the academic knowledge on the topic is still under development, with the number of publications growing during the last years. It also revealed that previous studies have mainly focused on the typology and operations of different corporate-startup engagement models, as well as on the characteristics of the corporate-startup relationships themselves, highlighting the asymmetric side of strategic alliances and the coopetition that might happen between both parties.

The review has shown that there are many opportunities for further research within the topic, including a better understanding of the complementarity between different corporate-startup engagement models, a broader investigation on the outcomes achieved by established firms through corporate accelerators, and a discussion about the several legal mechanisms that support the relationship between both parties.

The synthesis of the current academic knowledge on corporate-startup engagement and the opportunities for further investigation identified in this literature review have contributed to the formulation of the research project introduced in the next chapter.

3 RESEARCH PROJECT

This chapter presents the research project developed to further expand the knowledge on the engagement between large companies and startups. It introduces the research questions, the conceptual framework, and the research design and methods.

3.1 Research questions

Among the themes discussed in the literature review on the engagement between large corporations and startups, this research project focused to further study the corporate-startup engagement model of corporate accelerators.

As presented in the last chapter, the literature on corporate accelerators is quite recent, with publications mainly focusing on their typology (Kanbach & Stubner, 2016; Moschner et al., 2019; Weiblen & Chesbrough, 2015) and on their operations and key features (Ben Mahmoud-Jouini et al., 2018; Connolly et al., 2018; Kohler, 2016; Kupp et al., 2017; Richter et al., 2018; Shankar & Shepherd, 2019). A few studies also covered the challenges related to running this type of program (Jackson & Richter, 2017; Urbaniec & Žur, 2020) and the benefits it generates (Gutmann et al., 2019; Urbaniec & Žur, 2020).

While these studies contribute to a better understanding of what are corporate accelerators and clarify how they are built and operated, they still have limitations regarding an important aspect for a complete comprehension of these initiatives, which are the outcomes that these programs bring to the corporations running them (Gutmann et al., 2019; Kanbach & Stubner, 2016; Urbaniec & Žur, 2020). In addition to this gap, there is also a lack of understanding about how established firms measure the value that these programs add to their organizations (Bauer & Obwegeser, 2016; Ben Mahmoud-Jouini et al., 2018; Gutmann et al., 2019). Therefore, this research project aims to address these knowledge gaps by clarifying the following research questions:

RQ1: What outcomes do large corporations achieve when engaging with startups through corporate accelerators?

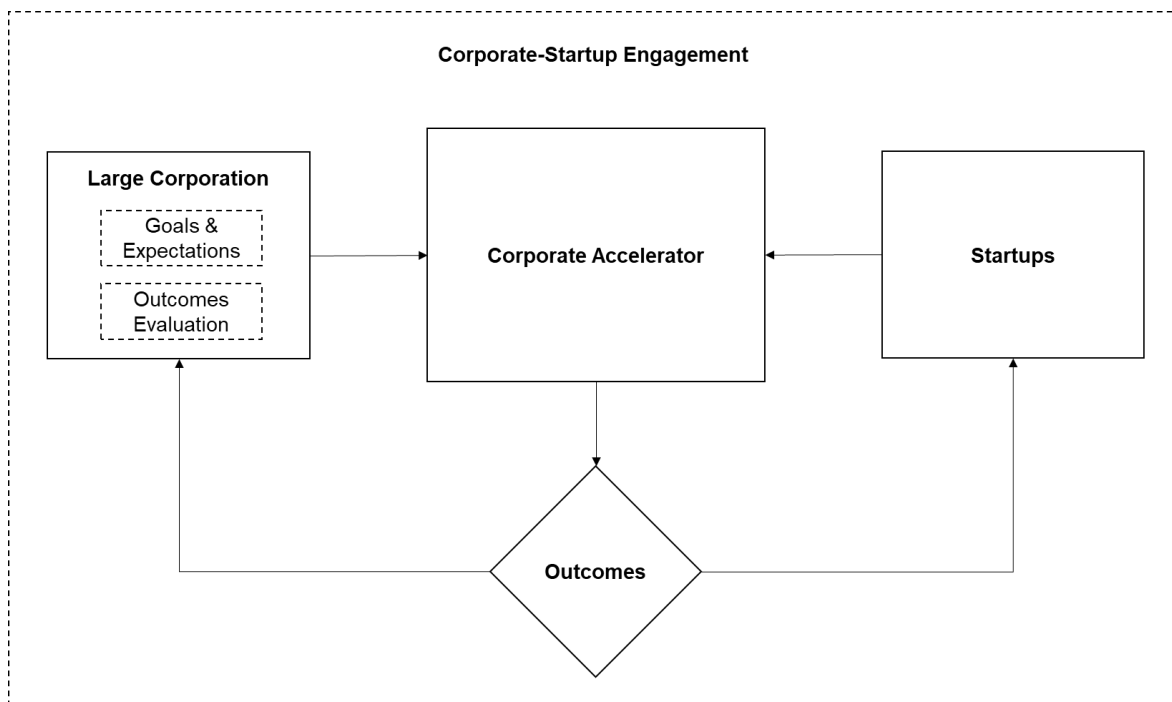
RQ2: How large corporations measure the value that corporate accelerators add to their organizations?

3.2 Conceptual framework

The conceptual framework is a frame that explains the main things to be studied in a research – the key factors, constructs or variables – and the relationships between them (Miles & Huberman, 1994). *Figure 4* presents the conceptual framework for this research project. It describes the relationships amongst the large corporations, the startups, the corporate accelerator, and the outcomes it generates.

Since this research project aims to study the outcomes achieved through corporate accelerators in the large corporations' perspective, the conceptual framework describes only the activities relevant to the established firm's side of the corporate-startup engagement.

Figure 4 - Conceptual Framework



Source: Author

3.2.1 Definition of the conceptual framework concepts

Large corporation: For the purposes of this study, a large corporation is defined as any company with more than 250 employees (OECD, 2018).

Startup: Startups are defined as temporary organizations in search for a repeatable and scalable business model (Blank & Dorf, 2012).

Corporate accelerator: A corporate accelerator is defined as corporation-supported programs of limited duration that support cohorts of startups through mentoring, education and corporation's specific resources (Kohler, 2016).

Outcomes: In this study, outcomes are defined as the results or impacts generated by the engagement between large corporations and startups through corporate accelerators.

Large corporation's goals: This concept indicate the goals set by large corporations when engaging with startups through corporate accelerators. Setting clear goals is a very important activity, as it drives the program's operations and potential outcomes (Richter et al., 2018).

Outcomes evaluation: Outcomes evaluation is the activity of measuring the value that corporate accelerators add to large corporations. This is an essential activity to evaluate if the corporate goals are being achieved (Kanbach & Stubner, 2016).

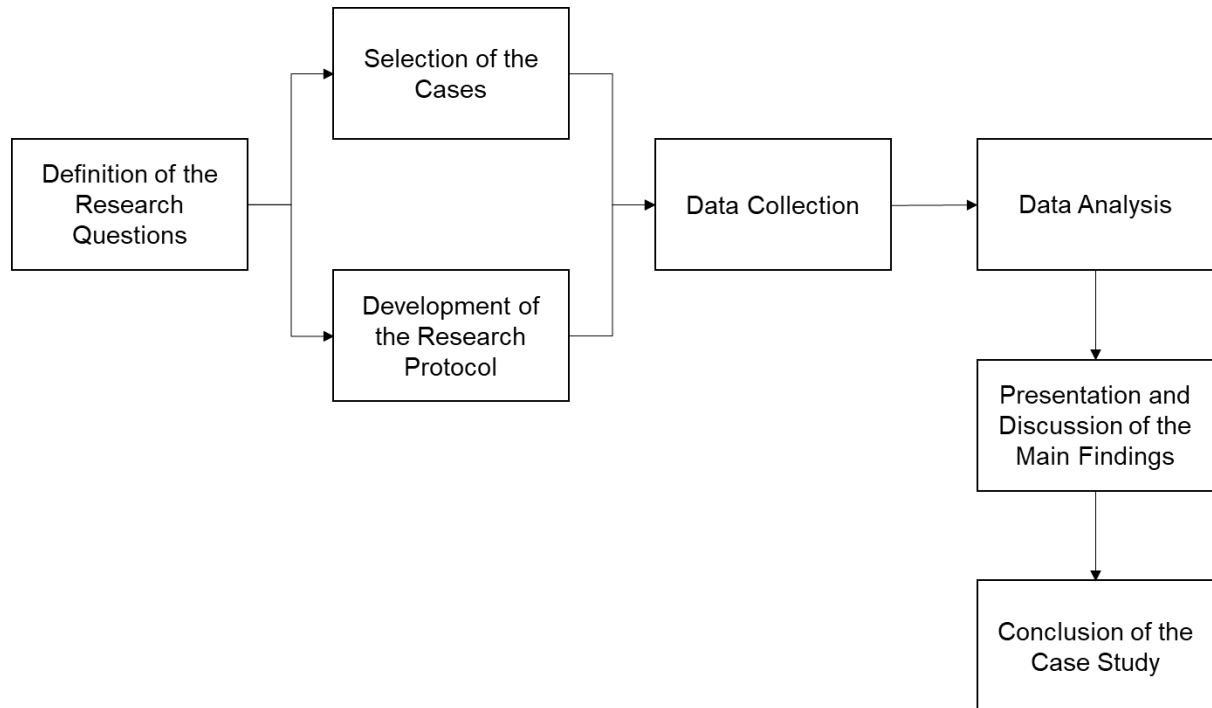
3.3 Research design and methods

Given the exploratory needs of the research questions and the contemporaneity of the topic under research, a multiple case study research methodology has been chosen to conduct this investigation (Eisenhardt, 1989).

This methodology comprised seven main steps, including the definition of the research questions, the selection of the cases, the development of the research instruments and protocols, the data collection, the data analysis, the presentation and discussion of the main findings, and the conclusion of the case study (see *Figure 5* for the

full method employed). These steps are going to be presented throughout this and the following chapters.

Figure 5 - Case study methodology



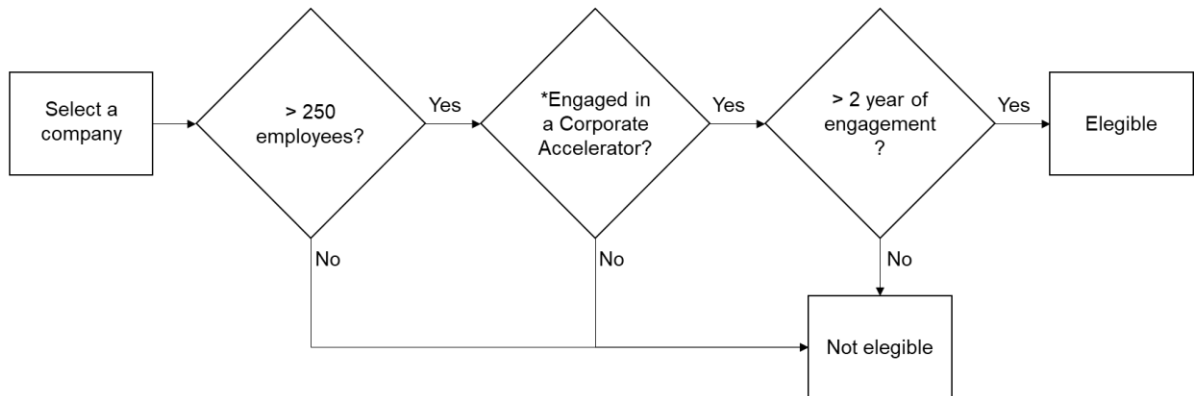
Source: Author, based on Eisenhardt (1989)

3.3.1 Case selection

Case selection is a critical aspect of case study research (Eisenhardt, 1989). Miles and Huberman (1994) outlined that selecting cases involves two activities. The first is setting the boundaries of what will be studied, which needs to be directly connected to the research questions and conceptual framework. The second activity is to create a sampling frame that supports the selection of the cases.

To achieve a profound understanding of the research questions outlined in *Section 3.1*, the sampling of this study was based on large corporations with a solid experience of engaging with startups through corporate accelerators. The corporations to be eligible for the study needed to have at least 2 years of corporate-startup engagement through this model. The case sampling frame presented in *Figure 6* comprises the case eligibility criteria.

Figure 6 – Case sampling frame



*Corporate Accelerator Program characteristics (Kohler, 2016):

- an open application process;
- limited-duration support to startups comprising company interactions and intensive mentoring;
- involves the participation of cohort of startups rather than individual companies.

Source: Author

Based on a study conducted by Salles (2018), who identified more than 130 corporate-startup engagement programs in Brazil, and on a complementary search on Startupi and StartSe – two Brazilian specialized portals about entrepreneurship and startups – 12 eligible large companies following the case sampling frame were found. Due to the researcher’s convenience and ease of access to the data, 4 corporations out of the 12 eligible have been selected for the study. *Table 8* summarizes their details with regards to the case sampling frame.

Table 8 – Research sample overview

| Corporation | Industry | Nº of Employees | Engaged in a Corporate Accelerator? | Years of engagement |
|-------------|--------------------|-----------------|-------------------------------------|---------------------|
| A | Electric Utilities | 10000+ | Yes | 4 |
| B | Insurance | 13000+ | Yes | 5 |
| C | IT Services | 7000+ | Yes | 4 |
| D | Automotive | 10000+ | Yes | 4 |

Source: Author

3.3.2 Research protocol

The research protocol comprises the research instruments, procedures and rules that should be adopted in using the instruments, as well as it indicates from where different sets of information are to be obtained. It tends to increase the reliability of the case study and is essential for carrying multiple-case studies, as it guides the researcher in conducting the investigations (Yin, 1994).

In this research project, data were collected based on a questionnaire that included questions about general aspects of the corporate accelerators studied, their management structure, and the related goals and expectations of the large corporations running them. It also comprised questions about the main outcomes achieved by the established firms with the initiatives, as well as the methods they used to measure these outcomes. *Table 9* presents this research questionnaire.

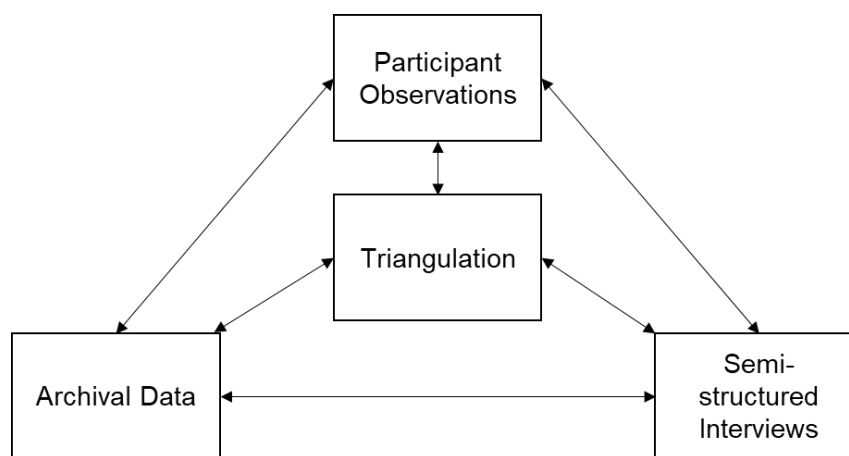
Table 9 - Research questionnaire

| Dimension | Main questions |
|---|---|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas and technologies of interest? 1e. What benefits are offered to the startups? |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? |
| 4 - Outcomes achieved with the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? |
| 5 - Methods used to evaluate the value added by the corporate accelerator | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? |

Source: Author

To achieve triangulation and increase the reliability of the results obtained with this case study, the data were collected through 3 different approaches, which the relationship is illustrated in *Figure 7*. These approaches comprised participant observations of the cases, analyses of primary and secondary archival data, and semi-structured interviews with representatives of the large corporations and initiatives studied. The procedures carried out within each of these data collection approaches will be described in more detail in the next section.

Figure 7 - Data triangulation approach



Source: Author

3.3.3 Data collection approaches

As stated in the previous section, three data collection approaches were employed to gather the data for this multiple cases study, including participant observations of the corporate-startup engagements, analyses of primary and secondary archival data related to the cases under study, and semi-structured interviews with representatives of the 4 large corporations selected for this investigation. Next sections will describe the procedures taken in each of these approaches.

3.3.3.1 Participant observations

The observations focused on how the selected large corporations operated their corporate accelerator initiatives, as well as on how they managed the outcomes generated within the programs. The observations in loco took place between June 2018 and May

2020. In total, 8 acceleration batches were observed, which comprised the participation of 45 startups and over 100 people, including executives and employees of the large corporations.

It should be noted that the observations were of the participant type, as the observing researcher had an active role in the management of the observed corporate accelerator initiatives. Having worked for a specialized consulting firm that offers acceleration services to large corporations, the researcher was responsible for managing the activities of 2 acceleration batches for *Company C* and 1 for *Company D*. He also supported and observed the organization of 4 acceleration batches of *Company B*, where he was responsible for the evaluation of several startups to analyze the fit with the established firm. At the time of writing this dissertation, the observing researcher leads the innovation department of *Company A*, where the corporate accelerator is also under his management. See *Table 10* for the list of the participant observations conducted.

Table 10 - List of participant observations conducted

| Company | Observing Researcher | Relationship with the Corporate Accelerator | Level of involvement | Observing period |
|----------------|-----------------------------|---|-----------------------------|----------------------------------|
| A | - Rafael Marciano | Principal manager of the initiative | Complete participation | 1 acceleration batch: ~6 months |
| B | - Rafael Marciano | Evaluator of the startups accelerated by the initiative | Moderate participation | 4 acceleration batches: ~2 years |
| C | - Rafael Marciano | Manager of the accelerator's activities | Active participation | 2 acceleration batches: ~1 year |
| D | - Rafael Marciano | Manager of the accelerator's activities | Active participation | 1 acceleration batch: ~6 months |

Source: Author

Due to the responsibilities attributed to the observing researcher, it was possible to perform an in-depth investigation of the cases, which was recorded in a digital logbook of the researcher following the research questionnaire presented in *Section 3.2.2*. During the observations, the researcher had continuous access to the corporate executives of the observed corporations, as well as to strategic information regarding the projects they

developed with the accelerated startups and the management reports of the corporate accelerators, which will be described in the next section.

3.3.3.2 Archival data

During the case study, primary and secondary archival data related to the corporate accelerator initiatives under study were collected. Primary data consisted of management reports regarding the operations of the corporate accelerators, the projects developed between the corporations and the accelerated startups, and the experience assessments of corporate employees with the programs. The reports and assessments referred to the same period as the participant observations were conducted, between June 2018 and May 2020. The analysis of them had the objective of answering the questions 3a, 4a, 4b, 5a and 5b of the research questionnaire (see *Table 9*).

Secondary data consisted basically of the accelerator's and corporation's websites, specialized news portals and other publicly available media. The analysis of these data focused on double checking the answers for questions 1a, 1b, 1c, 1d and 1e of the research questionnaire, as well as on complementing the responses for questions 3a, 4a and 4b. *Table 11* displays the relationship of the collected archival data with the dimensions of the research questionnaire.

Table 11 - Archival data collected vs dimensions of the research questionnaire

| | Management reports | Employee experience assessments | Corporations' and accelerators' websites | Other publicly available media |
|--|--------------------|---------------------------------|--|--------------------------------|
| Dimensions/Archival data | | | | |
| General information about the corporate accelerator | | | x | |
| Management structure of the corporate accelerator | | | x | |
| Main goals and expectations with the corporate accelerator | | x | x | x |
| Outcomes achieved with the corporate accelerator | x | x | | x |
| Methods used to evaluate the value added by the corporate accelerators | x | | | |

Source: Author

3.3.3.3 Semi-structured interviews

After the compilation of the observed data and the archival data, semi-structured interviews were conducted with representatives of the 4 large corporations, including corporate directors and managers who were directly involved with the corporate accelerators, and accelerator program managers from consulting firms assisting these established firms to develop and manage their programs. The interviews focused on validating the data collected with the observations and archival documents, as well as on identifying new points of view related to the questions within the research questionnaire.

The interviews lasted about 1 hour on average and were conducted mostly remotely via video conferences or phone calls, with only one being conducted in person (see *Table 6 for more information on the interviews*). They all followed the research questionnaire presented in *Section 3.3.2*, which first covered general questions about the corporate accelerators and its management structure, and then focused on exploring the corporations' goals and expectations with the initiatives, the outcomes they have achieved through these programs and the indicators they employ to measure the value that these initiatives add to the organizations. At the end of the interviews, respondents were also encouraged to add any relevant information that was not addressed following the research questionnaire. See *Table 12* for more information about the semi-structured interviews.

Table 12 - List of the conducted semi-structured interviews

| Company | Interviewees | Relationship with the Corporate Accelerator | Type of interview | Date Duration |
|----------------|-------------------------------|--|--------------------------|-------------------------------------|
| A | - Innovation Director | Sponsor of the initiative | Video conference | 08/04/2020 1 hour and 10 minutes |
| | - Investment Manager | Direct beneficiary of the initiative | Phone call | 17/04/2020 57 minutes |
| B | - Accelerator Program Manager | Manager of the accelerator program's activities | Video conference | 15/04/2020 1 hour and 2 minutes |
| C | - Accelerator Program Manager | Manager of the accelerator program's activities | Video conference | 08/07/2020 58 minutes |
| D | - IT Governance Manager | Leader of the initiative | In-person | 13/11/2019 48 minutes |

Source: Author

3.3.4 Data analyses procedure

A 3-steps data analysis procedure was employed to analyze the data collected (Eisenhardt, 1989; Miles & Huberman, 1994). It comprised the elaboration of individual case reports, within-case analyses, and cross-case analysis. The following sections will describe each of these steps.

3.3.4.1 Step 1: Individual case reports, preparing and organizing the data

Before the analyses started, the raw data collected was prepared and organized. The observation notes, the associated archival data and the interviews' transcripts were carefully reviewed and converted into individual reports for each of the 4 cases (*see the elaborated individual case reports in Chapter 4, Section 4.1*). As it can be seen in *Table 13*, the reports followed the same structure of the research questionnaire presented in *Section 3.3.2*. They were the basis for the following steps of the data analysis.

Table 13 - Case individual report example

| Dimension | Main questions | Empirical Data |
|---|---|-----------------------|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas and technologies of interest? 1e. What benefits are offered to the startups? | Example |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | Example |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | Example |
| 4 - Outcomes achieved with the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | Example |
| 5 - Methods used to evaluate the value added by the corporate accelerator | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | Example |

Source: Author

3.3.4.2 Step 2: Within-case analysis, creating first codes and coding

Coding is an analysis methodology to review and categorize collected data. This part of analysis involves how you differentiate and cluster the data you have gathered, as well as the reflections you make about this information (Miles & Huberman, 1994).

An initial list of codes was created based on the research questions, the conceptual framework, the literature review, and on the empirical knowledge of the researcher conducting this study (see *Chapter 4, Section 4.2 for the initial lists of codes*). It included codes about the outcomes achieved by large corporations when engaging with startups through corporate accelerators and the indicators used to measure the value that these initiatives add to their organizations. With this initial list in hand, the case individual reports were then reviewed and each passage that conveyed a particular theme or topic was labeled with one or more codes that reflected the information described.

As the process progressed, several codes emerged due to the appearance of new concepts and others were changed to better reflect the facts described. By coding the data, it was possible to identify differences in how interviewees described key factors and concepts, which motivated follow-up clarifying questions with the large corporations' representatives. *Table 14* and *Table 15* present the first-cycle outcomes and indicators codes generated, which will be discussed in more detail in *Chapter 4, Section 4.2*.

Table 14 - First cycle outcomes codes

| ID | First cycle codes | Codes description |
|-----------|--------------------------|---|
| 1 | OUT-INSIGHTS | Access to new technological and market insights |
| 2 | OUT-CODEVELOPMENT | Co-development of new products, services and business models |
| 3 | OUT-TIMETOMARKET | Reduction of time-to-market |
| 4 | OUT-EFFICIENCY | Increased operational efficiency through the use of the startup's solutions |
| 5 | OUT-CULTURE | Positive impact on the corporate culture |
| 6 | OUT-IMAGE | Enhanced brand image |
| 7 | OUT-NETWORKING | Expansion of networking and institutional relationships |
| 8 | OUT-CHANNELS | Develop new distribution channels |
| 9 | OUT-TESTING | Test new technologies and solutions |
| 10 | OUT-PROCESSINNOV | Processes' improvements from learning with startups |
| 11 | OUT-PIPELINE | Qualified pipeline for direct investments |

Source: Author

Table 15 - First cycle indicators codes

| ID | First cycle codes | Codes description |
|----|--------------------|--|
| 1 | KPI-NPROJECTS | Number of collaborative projects developed with the startups (Proofs of concept, pilots, etc.) |
| 2 | KPI-NCODEVELOPMENT | Number of new products, services or business models co-developed |
| 3 | KPI-TIMETOMARKET | Time-to-market to introduce a new product, service or business model |
| 4 | KPI-SATISFINDEX | Employees satisfaction index |
| 5 | KPI-COSTREDUCTION | Cost reduction with operational efficiency initiatives |
| 6 | KPI-LEADTIME | Lead time to perform a certain routine or activity |
| 7 | KPI-NDEPARTMENTS | Number of departments that developed projects with the startups |
| 8 | KPI-NEMPLOYEES | Number of employees impacted by the program's activities |
| 9 | KPI-EXPASSESSMENT | Employee experience assessment |
| 10 | KPI-NINVESTMENTS | Ratio of invested startups (startups invested/cohort) |
| 11 | KPI-MEDIAMENTIONS | Number of media mentions |
| 12 | KPI-RATIOMENTIONS | Ratio of positive and negative media mentions |
| 13 | KPI-EARNEDMEDIA | Earned media value per year |
| 14 | KPI-NAPPLICATIONS | Number of startup applications per batch |
| 15 | KPI-ACCURACY | Accuracy of a specific procedure |

Source: Author

3.3.4.3 Step 3: Cross-case analysis, searching for patterns

First cycle coding aims to categorize and summarize segments of data. Pattern searching, as a second cycle method, focuses to group these summaries into a smaller number of categories. It helps cross-case analysis by surfacing common themes, explanations, and relationships among constructs (Miles & Huberman, 1994).

To help find cross-case patterns, all first cycle codes were listed, as well as their meanings. Since code master categories had already been created in step 2 – outcomes and indicators –, the search for patterns happened within these two main themes, which are the main topics that this research project aims to better understand.

All codes and respective meanings were reviewed and clustered when similarities were found. The collected data related to these codes were also revised and constant compared to better sense the connection between concepts. The clustering of codes involved many iterations until theoretical saturation was reached, that is, when no new patterns emerged within a category.

This cross-case pattern search process allowed the researcher to identify the different outcomes that large corporations achieve when they engage with startups through corporate accelerators, as well as the methods they use to measure the value that this initiatives add to their organizations. *Table 16* presents the pattern categories related to the outcomes achieved by the established firms studied in this investigation. In *Chapter 4, Section 4.3*, this cross-case patterns will be discussed in more detail, as well as the pattern categories related to the indicators employed to evaluate corporate accelerator initiatives.

Table 16 - Pattern categories related to outcomes achieved with corporate accelerators

| ID | Pattern categories | First cycle codes | Codes description |
|-----------|--|---|--|
| 1 | Acquisition of new technological and market knowledge | OUT-INSIGHTS OUT-TESTING | Access to new technological and market insights Test new technologies and solutions |
| 2 | Co-development of new products, services and business models | OUT-CODEVELOPMENT OUT-TIMETOMARKET OUT-CHANNELS | Co-development of new products, services and business models Reduction of time-to-market Develop new distribution channels |
| 3 | Gains in operational efficiency | OUT-EFFICIENCY | Increased operational efficiency through the use of the startup's solutions |
| 4 | Positive impact on organizational culture | OUT-CULTURE OUT-PROCESSINNOV | Positive impact on the corporate culture Processes' improvement from learning with the startups |
| 5 | Positive effect on corporate image | OUT-IMAGE | Enhanced brand image |
| 6 | Network development | OUT-NETWORKING | Expansion of networking and institutional relationships |
| 7 | Qualified investment pipeline | OUT-PIPELINE | Qualified pipeline for direct investments |

Source: Author

4 CASE STUDIES

This chapter presents the case studies conducted with 4 large corporations engaging with startups through corporate accelerators. Following the methodology presented in the last chapter, it introduces the individual case reports generated with the data collected, the within-case analyses realized for each case and the cross-case analysis conducted to find common patterns among them.

4.1 Individual case reports

The individual case reports comprise a synthesis of the main data collected within the participant observations, the analyses of the archival data, and with the semi-structured interviews with representatives of the large corporations and corporate accelerators studied.

4.1.1 Case 1: Corporation A

Corporation A is a publicly traded electric utility company with over 10000 direct and indirect employees in Brazil. Its corporate accelerator initiative has been in operation for almost 4 years and had already accelerated over 30 startups through 4 batches of acceleration. The program lasts about 4 months and is focused on identifying new technological and market trends, testing new solutions and technologies, and generating business opportunities with the startups.

The initiative has a global reach and looks for startups that address challenges such as energy storage, clean energy, smart grids, e-mobility and decentralized energy systems. It also seeks solutions and technologies that can increase the efficiency of the firm's internal processes, like finance, legal, human resources, marketing, supply chain, and others. Impact startups are also on the radar of the company, which has an objective to improve the quality of life of disadvantaged communities and generate a positive social and environmental impact on society.

In terms of benefits for the startups, it offers business and strategic partnerships opportunities, access to a wide pool of specialized mentors and experts, and a prize of

50.000€ for the company that stands out the most in each batch. There is no offer of investments in exchange for equity in the startups, but since this company also operates a corporate venture capital fund, investments might be a possibility after the program ends. At the time of writing this dissertation, previously accelerated startups represent 33% of the CVC unit's current portfolio.

The program is managed in-house by the company's innovation department, which also has the support of an external specialized consultancy firm for sourcing and selecting the startups. To accelerate the development of business opportunities with the startups, the firm set a specific budget line for funding proofs of concept and pilot projects. This way, the opportunities are not totally dependent on the budget reserve of the business units to be developed, which can be an obstacle for some projects.

Regarding the outcomes achieved with the engagement with startups through the corporate accelerator, the interviewees of *Corporation A* highlighted the access to new technological and market knowledge, gains in operational efficiency through the use of the startups' solutions and a reduction of time-to-market in the introduction of new products and business models. They also pointed out a positive impact on the organizational culture of the company, as well as a greater recognition as an innovative corporation by the market. The development of a valuable network was also stated by them, which mentioned the connections de with high level entrepreneurs and investors.

Concerning the methods used to evaluate the value that the corporate accelerator adds to the organization, this company stands out among the other corporations studied, being the one that presented the greater level of accountability. It employs several indicators to measure the impact of the initiative, such as the number of proofs of concept and pilot project developed, the number of employees impacted by program's activities and the earned media value generated by the mentions of the accelerator in the media. The full list of indicators mentioned by the interviewees can be seen in *Table 17*, which presents the individual report of this case.

Table 17 - Case 1 - Individual case report

| Dimension | Main questions | Empirical data |
|---|--|---|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been conducted and 31 startups accelerated. Its main areas of interest are related to clean energy, smart grids, energy storage, e-mobility and decentralized energy systems, as well as positive impact startups and solutions that can increase internal processes' efficiency. For the startups, it offers business opportunities, specialized mentorship and a prize of 50.000 € for the startup that most stands out in the program. There is no investment in exchange of equity in the startups. |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The program is managed in house by the Innovation department, which has the support of a specialized consulting firm for sourcing the startups. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To gain access to new technological and market insights, as well as to accelerate the development of new business models and the testing of new solutions and technologies. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Access to new technological and market insights - Gains in operational efficiency through the use of the startups' solutions - Reduction of time-to-market - Positive impact on the organizational culture - Recognition as an innovative company by the market - Generation of a qualified startup investment pipeline for its Corporate Venture Capital fund - Network development |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of startup applications - Number of proofs of concept/pilots projects developed - Cost reduction in a given operation - Number of employees impacted by the initiative - Number of departments that engaged with the startups - Employee satisfaction index - Employee experience assessment - Earned media value - Number of media mentions - Ratio of positive and negative mentions in the media - Ratio of invested startups |

Source: Author

4.1.2 Case 2: Corporation B

Corporation B is a publicly traded Brazilian insurance enterprise that employs over 13000 employees. Its corporate accelerator initiative is the one with the longest operating time among the research sample and is also one of the oldest in the country still in operation (Salles, 2018). With over 5 years of operations, it had already accelerated more than 50 startups through 9 batches of acceleration, which all had a 3 months duration.

The main goal of the company with the initiative is to find opportunities that can increase its income, reduce costs, or enhance its operational efficiency, as well as anticipate technological and market trends. For that, the corporation seeks startups that operate in a wide variety of markets, such as insurance, automotive services, residential services, health, safety and security, telecommunications, financial solutions, among others. It also looks for innovative solutions that can be applied to solve the challenges of its internal business departments, such as marketing, procurement, and human resources.

Regarding the benefits for the startups, the company offers business opportunities specialized mentorship, a coworking space where entrepreneurs can work together and advantages in various services and management tools. Currently the program no longer offers investment in exchange for equity in the startups, but offered up to its seventh batch, having the company invested in over 30 startups during this time. The investment ticket size ranged from R\$ 200.000,00 to R\$ 500.000,00, in exchange of 5 to 10% equity.

The research and development department is responsible for the corporate accelerator and an external specialized consultancy firm gives support in all the phases of the program, from sourcing the startups to the development of the business opportunities. Besides the external startups, the initiative might also support projects idealized within the company, which are run by corporate employees. In these cases, employees receive an unpaid leave of 3 months to focus their efforts on developing the business model of this new opportunity, getting all the support that the program offers. If successful, the project can become a spin-off and receive investments from the corporation and the employees involved can opt to leave the parent company and lead

this new business. If the project does not obtain validation by the company's leadership, the employees may return to their regular routines within the organization.

Concerning the outcomes achieved with the corporate accelerator initiative, the interviewee of Corporation B pointed out the identification of new technological and market trends, a reduction of time-to-market in introducing new products and services, and the development of new market channels. She also highlighted gains in operational efficiency with the use of the startups' solutions, a rejuvenation of the company's culture and a positive effect on the corporate brand in the market. Moreover, a high-level networking was also mentioned by them, as the company developed a valuable network of connections with industry experts, entrepreneurs, and executives from other established firms.

In terms of the methods used to evaluate the initiative, the respondent mentioned that they monitor the number of startup applications per batch, the employee satisfaction index, the number of employees involved in the initiative and other indicators related to the projects developed, such as the lead time to perform a certain routine or the cost effectiveness of a given operation. The individual case report presented in *Table 18* describes other indicators employed by Corporation B, as well as the other empirical data collected in the case study.

Table 18 - Case 2 - Individual case report

| Dimension | Main questions | Empirical data |
|---|--|--|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | The corporate accelerator initiative was launched in 2015. Since then, 9 batches of acceleration have been completed and 51 startups accelerated. Its main areas of interest are related to insurance, automotive services, residential services, health, safety and security, telecommunications and financial solutions. For the startups, it offers business opportunities, specialized mentorship, a coworking space and benefits in various services and management tools. It no longer offers investment in exchange of equity in the startups, but it offered R\$ 200 - 500k up to its 7th batch of acceleration. |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The program is managed in house by the R&D department, which has the support of a specialized consulting firm for managing all the phases of the program. Besides the external startups, the program also accelerates some projects idealized internally in the company. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | Anticipate technological and market trends, as well as to find opportunities that can increase the company's income, reduce operational costs and enhance operational efficiency. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technology and market trends - Gains in operational efficiency through the use of the startups' solutions - Development of new market channels - Reduction of time-to-market - Rejuvenation of the company culture - Brand enhancement - Network development - Generation of a qualified startup investment pipeline |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of startup applications - Number of proofs of concept/pilot projects developed - Number of employees impacted by the initiative - Employee satisfaction index - Employee experience assessment - Indicators related to projects, such as the lead time to perform a certain routine or the cost effectiveness of a given operation. |

Source: Author

4.1.3 Case 3: Corporation C

Corporation C is a Brazilian IT services multinational that employs over 7000 employees. It participates in a consortium accelerator initiative powered by an external professional accelerator. It has been involved in 4 batches of acceleration, engaging with more than 20 startups. All the batches had a 4 months duration and were equity-free, which means there were no investments in exchange of equity in the startups.

Its main goals with the initiative are to accelerate the development of new products and services, as well as to develop net market channels. For that, it focuses on engaging with startups that offer solutions based on emerging technologies, such as internet of things, big data and analytics, artificial intelligence, computer vision, new payments methods or any other technology that can transform the business environment within the next 5 to 10 years.

With regards to the benefits for the startups, the company offers business and partnership opportunities where the startups can create a joint proposal for one of their many clients. Moreover, it also offers specialized mentorship and different other perks, including advantages on its own cloud services.

Unlike the previous cases, this corporate accelerator is managed externally by a specialized consulting firm, which runs all the operations of the initiative. Besides Corporation C, there have been also other 5 established firms participating in the different batches of the program. Although not managed directly by the company, there is a great involvement of its key executives and employees in the initiative, with some of them being responsible for identifying business opportunities with the startups.

Concerning the outcomes achieved along these 4 batches of acceleration, the interviewee of Corporation C highlighted the identification of new market opportunities, the co-development of new products and services, and the development of new market channels. Furthermore, he also referred to a positive impact on the corporate culture and a positive effect on the corporate image as benefits of the initiative.

To measure the value added by the initiative, the respondent mentioned the use of indicators such as time-to-market, number of employees impacted by the program and the number of projects developed. More information about this case can be observed in *Table 19*.

Table 19 - Case 3 - Individual case report

| Dimension | Main questions | Empirical data |
|---|--|--|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | <p>The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been completed and 24 startups accelerated.</p> <p>Its main areas of interest are related to emerging technologies, such as internet of things, big data and analytics, artificial intelligence, computer vision, new payment methods and others.</p> <p>For the startups, it offers business opportunities, specialized mentorship and benefits in various services, including its own cloud services. There is no investment in exchange of equity in the startups.</p> |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The accelerator is managed externally by a specialized consulting firm, which runs all the operation of the initiative. Besides Company C, other large companies also participate in this consortium accelerator. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To accelerate the development of new products, services and business models, as well as to develop new market channels. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technological and market trends - Co-development of new products and services - Development of new market channels - Positive impact on the corporate culture - Brand enhancement - Network development |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of startup applications - Number of proofs of concept/pilot projects developed - Time to market - Number of employees impacted by the initiative - Employee satisfaction index - Employee experience assessment |

Source: Author

4.1.4 Case 4: Corporation D

Corporation D is a Brazilian subsidiary of a German automotive group, which employs more than 10000 employees in Brazil. As *Corporation C*, it also participates in a consortium accelerator, where it was involved in 4 batches of acceleration and connected with more than 20 startups. The batches, which were also equity-free and lasted 4 months, counted with the participation of other 8 established firms in its different editions, with only this company participating in all of them.

The initiative, which is industry-oriented, focuses on accelerating and generating business with startups that operate in the automotive, logistics, transportation, and mobility markets. It seeks solutions that can be applied to fleet management, production management, warehouse management, vehicle telemetry, sales and after-sales services, automotive insurance, mobile payments, and many other areas of interest. With the program, the company seeks to explore new technological and market trends, gain speed in the development of new business models, and identify solutions that can bring more efficiency to its operations and internal departments.

In terms of benefits for the startups, the program offers business and partnership opportunities with the large companies that are engaging in, as well as access to specialized mentors and industry experts. It also offers perks related to web services and many other support services, such as legal and accounting.

With regards to the outcomes achieved with the corporate accelerator, the respondent of Corporation D pointed out the identification of new solutions and market opportunities, gains in operational efficiency through the implementation of new technologies, greater speed in the development of new business models and a positive impact on the organizational culture. Moreover, she also mentioned positive effects on the corporate image of the company in the innovation ecosystem, as well as valuable connections with different market players.

Concerning the methods employed to measure the value added by the program, the respondent mentioned only 3 indicators that are constantly reviewed, which are the

number of projects developed with the startups, the employee satisfaction index and the employee experience assessment. See *Table 20* for the summarized empirical data collected for this case.

Table 20 - Case 4 - Individual case report

| Dimension | Main questions | Empirical data |
|---|--|--|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | <p>The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been completed and 28 startups accelerated.</p> <p>Its main areas of interest are related to the automotive, logistics, transportation and mobility markets.</p> <p>For the startups, it offers business opportunities, specialized mentorship and benefits in various services and management tools. There is no investment in exchange of equity in the startups.</p> |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The accelerator is managed externally by a specialized consulting firm, which runs all the operation of the initiative. Besides Company D, other large companies also participate in this consortium accelerator. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To explore new technological and market trends, gain speed in the development of new business models and find solutions that can increase the company's operational efficiency. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technological and market trends - Testing new solutions and technologies - Gain in operational efficiency through the use of the startups' solutions - Accelerated development of new business models - Positive impact on the corporate culture - Enhanced brand image - Network development |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of proofs of concept/pilot projects developed - Employee satisfaction index - Employee experience assessment |

Source: Author

4.2 Within-case analysis

As mentioned in *Chapter 3*, after collecting the data and generating the individual case reports, within-case analyses were conducted to categorize the data collected. For that, an initial list of codes was created based on the research questions, the conceptual framework, the literature review, and the empirical knowledge of the researcher conducting this study. Since the aim of this research project is to explore the outcomes that large companies achieve when engaging with startups through corporate accelerators and the indicators they use to evaluate the value added by these initiatives to their organizations, the first cycle coding step focused exclusively on these two subjects. The initial list of outcomes codes can be seen in *Table 21*, and the list of indicators codes in *Table 22*.

Table 21 - Initial list of outcomes codes

| ID | First cycle codes | Codes description |
|-----------|--------------------------|---|
| 1 | OUT-INSIGHTS | Access to new technological and market insights |
| 2 | OUT-CODEVELOPMENT | Co-development of new products, services and business models |
| 3 | OUT-TIMETOMARKET | Reduction of time-to-market |
| 4 | OUT-EFFICIENCY | Increased operational efficiency through the use of startup solutions |
| 5 | OUT-CULTURE | Positive impact on the corporate culture |
| 6 | OUT-IMAGE | Enhanced corporate image |
| 7 | OUT-NETWORKING | Expansion of networking and institutional relationships |

Source: Author

Table 22 - Initial list of indicators codes

| ID | First cycle codes | Codes description |
|-----------|--------------------------|--|
| 1 | KPI-NPROJECTS | Number of collaborative projects developed with the startups (Proofs of concept, pilots, etc.) |
| 2 | KPI-NCODEVELOPMENT | Number of new products, services or business models co-developed |
| 3 | KPI-TIMETOMARKET | Time-to-market |
| 4 | KPI-SATISINDEX | Employee satisfaction index |

Source: Author

With these initial lists in hand, the case individual reports were then reviewed and each passage that expressed a particular outcome or indicator was labeled with one or

more codes. As the process progressed, other codes emerged due to the appearance of new concepts and some were changed to better reflect the facts described. This first-cycle coding for each case can be observed in *Table 23*, *Table 24*, *Table 25*, and *Table 26*, which will be presented in the following pages.

Table 23 - Case 1 first cycle coding

| Dimension | Main questions | Empirical data |
|---|---|---|
| 1 - General information about the corporate accelerator initiative | <p>1a. When was the corporate accelerator initiative launched?</p> <p>1b. How many acceleration batches have already been completed?</p> <p>1c. How many startups have already been accelerated?</p> <p>1d. What are the areas of interest?</p> <p>1e. What benefits are offered to the startups?</p> | <p>The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been conducted and 30+ startups accelerated. Its main areas of interest are related to clean energy, smart grids, energy storage, e-mobility and decentralized energy systems, as well as positive impact startups and solutions that can increase internal processes' efficiency. For the startups, it offers business opportunities, specialized mentorship and a prize of 50.000 € for the startup that most stands out in the program. There is no investment in exchange of equity in the startups.</p> |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The program is managed in house by the Innovation department, which has the support of a specialized consulting firm for sourcing the startups. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To gain access to new technological and market insights, as well as to accelerate the development of new business models and the testing of new solutions and technologies. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | <p>4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator?</p> <p>4b. Can you give an example of each of these outcomes?</p> | <ul style="list-style-type: none"> - Access to new technological and market insights (OUT-INSIGHTS) - Gains in operational efficiency through the use of the startups' solutions (OUT-EFFICIENCY) - Reduction of time-to-market (OUT-TIMETOMARKET) - Positive impact on the organizational culture (OUT-CULTURE) - Recognition as an innovative company by the market (OUT-IMAGE) - Generation of a qualified startup investment pipeline for its Corporate Venture Capital fund (OUT-PIPELINE) - Network development (OUT-NETWORKING) |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | <p>5a. How is the corporate accelerator initiative evaluated?</p> <p>5b. What indicators are employed to measure the value added?</p> | <ul style="list-style-type: none"> - Number of startup applications (KPI-NAPPLICATIONS) - Number of proofs of concept/pilots projects developed (KPI-NPROJECTS) - Cost reduction in a given operation (KPI-COSTREDUCTION) - Number of employees impacted by the initiative (KPI-NEMPLOYEES) - Number of departments that engaged with the startups (KPI-NDEPARTMENTS) - Employee satisfaction index (KPI-SATISINDEX) - Employee experience assessment (KPI-EXPASSESSMENT) - Earned media value (KPI-EARNEDMEDIA) - Number of media mentions (KPI-MEDIAMENTIONS) - Ratio of positive and negative mentions in the media (KPI-RATIOMENTIONS) - Ratio of invested startups (KPI-NINVESTMENTS) |

Source: Author

Table 24 - Case 2 first cycle coding

| Dimension | Main questions | Empirical data |
|---|--|--|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | The corporate accelerator initiative was launched in 2015. Since then, 9 batches of acceleration have been completed and 50+ startups accelerated. Its main areas of interest are related to insurance, automotive services, residential services, health, safety and security, telecommunications, and financial solutions. For the startups, it offers business opportunities, specialized mentorship, a coworking space and benefits in various services and management tools. It no longer offers investment in exchange of equity in the startups, but it offered R\$ 200 - 500k up to its 7th batch of acceleration. |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The program is managed in house by the R&D department, which has the support of a specialized consulting firm for managing all the phases of the program. Besides the external startups, the program also accelerates some projects idealized internally in the company. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | Anticipate technological and market trends, as well as to find opportunities that can increase the company's income, reduce operational costs and enhance operational efficiency. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technology and market trends (OUT-INSIGHTS) - Gains in operational efficiency through the use of the startups' solutions (OUT-EFFICIENCY) - Development of new market channels (OUT-CHANNELS) - Reduction of time-to-market (OUT-TIMETOMARKET) - Rejuvenation of the company culture (OUT-CULTURE) - Brand enhancement (OUT-IMAGE) - Network development (OUT-NETWORKING) - Generation of a qualified startup investment pipeline (OUT-PIPELINE) |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of startup applications (KPI-NAPPLICATIONS) - Number of proofs of concept/pilot projects developed (KPI-NPROJECTS) - Number of employees impacted by the initiative (KPI-NEMPLOYEES) - Employee satisfaction index (KPI-SATISINDEX) - Employee experience assessment (KPI-EXPASSESSMENT) - Indicators related to projects, as the lead time to perform a certain routine, the cost effectiveness of a given operation and the accuracy of a specific procedure (KPI-COSTREDUCTION) (KPI-LEADTIME) (KPI-ACCURACY) |

Source: Author

Table 25 - Case 3 first cycle coding

| Dimension | Main questions | Empirical data |
|---|--|--|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | <p>The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been completed and 24 startups accelerated.</p> <p>Its main areas of interest are related to emerging technologies, such as internet of things, big data and analytics, artificial intelligence, computer vision, new payment methods and others.</p> <p>For the startups, it offers business opportunities, specialized mentorship and benefits in various services, including its own cloud services. There is no investment in exchange of equity in the startups.</p> |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The accelerator is managed externally by a specialized consulting firm, which runs all the operation of the initiative. Besides Company C, other large companies also participate in this consortium accelerator. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To accelerate the development of new products, services and business models, as well as to develop new market channels. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technological and market trends (OUT-INSIGHTS) - Co-development of new products and services (OUT-CODEVELOPMENT) - Development of new distribution channels (OUT-CHANNELS) - Processes improvements (OUT-PROCESSINOV) - Positive impact on the corporate culture (OUT-CULTURE) - Brand enhancement (OUT-IMAGE) - Network development (OUT-NETWORKING) |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of startup applications (KPI-NAPPLICATIONS) - Number of proofs of concept/pilot projects developed (KPI-NPROJECTS) - Time to market (KPI-TIMETOMARKET) - Number of employees impacted by the initiative (KPI-NEMPLOYEES) - Employee satisfaction index (KPI-SATISINDEX) - Employee experience assessment (KPI-EXPASSESSMENT) |

Source: Author

Table 26 - Case 4 first cycle coding

| Dimension | Main questions | Empirical data |
|---|--|---|
| 1 - General information about the corporate accelerator initiative | 1a. When was the corporate accelerator initiative launched? 1b. How many acceleration batches have already been completed? 1c. How many startups have already been accelerated? 1d. What are the areas of interest? 1e. What benefits are offered to the startups? | <p>The corporate accelerator initiative was launched in 2017. Since then, 4 batches of acceleration have been completed and 28 startups accelerated.</p> <p>Its main areas of interest are related to the automotive, logistics, transportation and mobility markets.</p> <p>For the startups, it offers business opportunities, specialized mentorship and benefits in various services and management tools. There is no investment in exchange of equity in the startups.</p> |
| 2 - Management structure of the corporate accelerator | 2a. How is the corporate accelerator management structure organized? | The accelerator is managed externally by a specialized consulting firm, which runs all the operation of the initiative. Besides Company D, other large companies also participate in this consortium accelerator. |
| 3 - Main goals and expectations with the corporate accelerator | 3a. What are the company's main goals with the corporate accelerator? | To explore new technological and market trends, gain speed in the development of new business models and find solutions that can increase the company's operational efficiency. |
| 4 - Main outcomes achieved by engaging with startups through the corporate accelerator | 4a. What outcomes have the company achieved by engaging with startups through the corporate accelerator? 4b. Can you give an example of each of these outcomes? | <ul style="list-style-type: none"> - Identification of new technological and market trends (OUT-INSIGHTS) - Testing new solutions and technologies (OUT-TESTING) - Gain in operational efficiency through the use of the startups' solutions (OUT-EFFICIENCY) - Accelerated development of new business models (OUT-TIMETOMARKET) - Positive impact on the corporate culture (OUT-CULTURE) - Enhanced brand image (OUT-IMAGE) - Network development (OUT-NETWORKING) |
| 5 - Methods used to evaluate the value added by the corporate accelerator to the organization | 5a. How is the corporate accelerator initiative evaluated? 5b. What indicators are employed to measure the value added? | <ul style="list-style-type: none"> - Number of proofs of concept/pilot projects developed (KPI-NPROJECTS) - Employee satisfaction index (KPI-SATISINDEX) - Employee experience assessment (KPI-EXPASSESSMENT) |

Source: Author

4.3 Cross-case analysis

After the conclusion of the individual analyses of the cases, a cross-case analysis was performed in order to find patterns across the cases. To help this search for patterns, all the first cycle codes created after the within-case analysis were listed, as well as their descriptions. See *Table 27* for the final list of outcomes codes and *Table 28* for the final list of indicators outcomes.

Table 27 - Final list of outcomes codes

| ID | First cycle codes | Codes description |
|----|-------------------|---|
| 1 | OUT-INSIGHTS | Access to new technological and market insights |
| 2 | OUT-CODEVELOPMENT | Co-development of new products, services and business models |
| 3 | OUT-TIMETOMARKET | Reduction of time-to-market |
| 4 | OUT-EFFICIENCY | Increased operational efficiency through the use of the startup's solutions |
| 5 | OUT-CULTURE | Positive impact on the corporate culture |
| 6 | OUT-IMAGE | Enhanced brand image |
| 7 | OUT-NETWORKING | Expansion of networking and institutional relationships |
| 8 | OUT-CHANNELS | Develop new distribution channels |
| 9 | OUT-TESTING | Test new technologies and solutions |
| 10 | OUT-PROCESSINNOV | Processes' improvements from learning with startups |
| 11 | OUT-PIPELINE | Qualified pipeline for direct investments |

Source: Author

Table 28 - Final list of indicators codes

| ID | First cycle codes | Codes description |
|----|--------------------|--|
| 1 | KPI-NPROJECTS | Number of collaborative projects developed with the startups (Proofs of concept, pilots, etc.) |
| 2 | KPI-NCODEVELOPMENT | Number of new products, services or business models co-developed |
| 3 | KPI-TIMETOMARKET | Time-to-market to introduce a new product, service or business model |
| 4 | KPI-SATISFINDEX | Employees satisfaction index |
| 5 | KPI-COSTREDUCTION | Cost reduction with operational efficiency initiatives |
| 6 | KPI-LEADTIME | Lead time to perform a certain routine or activity |
| 7 | KPI-NDEPARTMENTS | Number of departments that developed projects with the startups |
| 8 | KPI-NEMPLOYEES | Number of employees impacted by the program's activities |
| 9 | KPI-EXPASSESSMENT | Employee experience assessment |
| 10 | KPI-NINVESTMENTS | Ratio of invested startups (startups invested/cohort) |
| 11 | KPI-MEDIAMENTIONS | Number of media mentions |
| 12 | KPI-RATIOMENTIONS | Ratio of positive and negative media mentions |
| 13 | KPI-EARNEDMEDIA | Earned media value per year |
| 14 | KPI-NAPPLICATIONS | Number of startup applications per batch |
| 15 | KPI-ACCURACY | Accuracy of a specific procedure |

Source: Author

With these final lists in hand, all codes and respective meanings were reviewed and clustered when similarities were found. The collected data related to these codes were also revised and constant compared to better sense the connection between concepts. The clustering of codes involved many iterations until theoretical saturation was reached, that is, when no new patterns emerged within a category. See *Table 29* for the pattern categories related to the outcomes achieved by large corporations when engaging with startups through corporate accelerators generated within the cross-case analysis.

Table 29 - List of pattern categories related to the outcomes achieved by large corporations with corporate accelerators

| ID | Pattern categories | First cycle codes | Codes description |
|-----------|--|--------------------------|---|
| 1 | Acquisition of new technological and market knowledge | OUT-INSIGHTS | Access to new technological and market insights |
| | | OUT-TESTING | Test new technologies and solutions |
| 2 | Co-development of new products, services and business models | OUT-CODEVELOPMENT | Co-development of new products, services and business models |
| | | OUT-TIMETOMARKET | Reduction of time-to-market |
| | | OUT-CHANNELS | Develop new distribution channels |
| 3 | Gains in operational efficiency | OUT-EFFICIENCY | Increased operational efficiency through the use of the startup's solutions |
| 4 | Positive impact on organizational culture | OUT-CULTURE | Positive impact on the corporate culture |
| | | OUT-PROCESSINNOV | Processes' improvement from learning with the startups |
| 5 | Positive effect on corporate image | OUT-IMAGE | Enhanced brand image |
| 6 | Network development | OUT-NETWORKING | Expansion of networking and institutional relationships |
| 7 | Qualified investment pipeline | OUT-PIPELINE | Qualified pipeline for direct investments |

Source: Author

On searching the patterns related to the methods employed by the large corporations analyzed to measure the value that corporate accelerators add to their organizations, we found that the best way to cluster the indicators would be by associating them with the outcomes achieved by the corporations in the cases, as there was a clear relationship between them. As the main outcomes highlighted by the interviewees are the ones that their companies value the most, the indicators we found were also related to

these same benefits. *Table 30* presents the patterns categories of the indicators observed in the cross-case analysis.

Table 30 - List of pattern categories related to the indicators employed by large corporations to evaluate corporate accelerators

| ID | Pattern categories | First cycle codes | Codes description |
|-----------|--|--------------------------|--|
| 1 | Indicators related to the acquisition of new technological and market knowledge | KPI-NAPPLICATIONS | Number of startup applications evaluated |
| | | KPI-NPROJECTS | Number of collaborative projects developed with the startups (Proofs of concept, pilots, etc.) |
| 2 | Indicators related to the co-development of new products, services and business models | KPI-NCODEVELOPMENT | Number of new products, services or business models co-developed |
| | | KPI-TIMETOMARKET | Time-to-market to introduce a new product, service or business model |
| 3 | Indicators related to gains in operational efficiency | KPI-COSTREDUCTION | Cost effectiveness of a given operation |
| | | KPI-LEADTIME | Lead time to perform a certain routine or activity |
| | | KPI-ACCURACY | Accuracy of a specific procedure |
| 4 | Indicators related to the development of the organizational culture | KPI-NEMPLOYEES | Number of employees impacted by the program's activities |
| | | KPI-NDEPARTMENTS | Number of departments that developed projects with the startups per batch |
| | | KPI-SATISFINDEX | Employees satisfaction index |
| | | KPI-EXPASSESSMENT | Employee experience assessment |
| 5 | Indicators related to the corporate image | KPI-MEDIAMENTIONS | Number of media mentions |
| | | KPI-RATIOMENTIONS | Ratio of positive and negative media mentions |
| | | KPI-EARNEDMEDIA | Earned media value per year |
| 6 | Indicators related to investments | KPI-NINVESTMENTS | Ratio of invested startups |
| 7 | Indicators related to network development | Not found | Not found |

Source: Author

This cross-case analysis allowed the researcher to identify similarities and differences between the case studies in a structured way, as well as to capture the findings that answer the research questions proposed in *Chapter 3*. Next chapter will describe these findings in more detail.

5 MAIN FINDINGS OF THE CASE STUDIES

This chapter presents the main findings of the multiple case study conducted with 4 large corporations engaging with startups through corporate accelerators. It introduces an overview of the established firms analyzed, the different outcomes they achieved through their accelerator programs and the methods they employ to measure the value that these initiatives add to their organizations.

5.1 Overview of the large corporations analyzed

Before presenting the main findings of this research project regarding the proposed research questions, it is interesting to provide an overview of the sample analyzed. The sample was composed by 4 large corporations that met the criteria of the case sampling frame presented in *Chapter 3, Section 3.1.1*.

These 4 established firms operate in different industries, including electric utilities, insurance, information technology services and automotive. They are all considered large corporations, employing between 7000 and 13000 people in their Brazilian operations. Two of them are publicly traded in Brazil, and other had its share capital open in the country until the beginning of the 2010s. The fourth is a subsidiary of a European company that has been operating in the country for a few decades already.

Regarding their corporate accelerators, the management structure of each of them vary. Following the typology described by Moschner et al. (2019), one of them is an in-house accelerator, that has been created and operated internally by the company, another is a hybrid accelerator, which has also been created and managed internally by the corporation, with the addition of not just developing opportunities with external startups, but also supporting internal innovation projects. The other two are characterized as consortium accelerators, a model where an independent external accelerator manages the program of behalf of several firms.

In terms of maturity with this corporate-startup engagement model, they all have at least 4 years of experience. Three of them have a similar history with their programs, having engaged with 24 to 31 startups through 4 batches of acceleration. The other has

a little more experience, at list in terms of numbers, having accelerated more than 50 startups through 9 batches of acceleration. None of them offered investments in exchange for equity in the startups at the time of writing this dissertation. However, *Corporation B* offered up to its seventh batch of acceleration. See *Table 31* for the synthesis of the sample characteristics.

Table 31 – Characteristics of the corporations analyzed

| Characteristics | Corporation A | Corporation B | Corporation C | Corporation D |
|---|----------------------|----------------------|------------------------|------------------------|
| Industry | Electric Utilities | Insurance | IT Services | Automotive |
| Nº of employees | 10000+ | 13000+ | 7000+ | 10000+ |
| Accelerator management structure | In-house accelerator | Hybrid accelerator | Consortium accelerator | Consortium accelerator |
| Years of experience with the corporate accelerator initiative | 4 | 5 | 4 | 4 |
| Nº of acceleration batches conducted | 4 | 9 | 4 | 3 |
| Nº of startups accelerated | 31 | 51 | 24 | 28 |
| Offers investment in exchange for equity in the startups? | No | Not anymore | No | No |

Source: Author

5.2 Outcomes achieved by large companies with corporate accelerators

The multiple case study revealed that large corporations achieve several outcomes when engaging with startups through corporate accelerators. In the following sessions, each of these outcomes will be described and discussed in more detail.

5.2.1 Acquisition of new technological and market knowledge

The investigations revealed that one of the main outcomes achieved by large corporations with corporate accelerator programs is the acquisition of new technological and market knowledge. Through the relationship with the startups, the representatives of the established firms under analysis stated that they could better understand how new technologies could be applied in their businesses, as well as identify new market trends and opportunities.

This process of new knowledge acquisition begins at the evaluation phase of the startups that will be selected to participate in the accelerator. The initiatives studied receive between 200 to 1400 startup applications for each of their batches of acceleration, which reflects a broad perspective on what is emerging in their markets. By evaluating these applications, corporation's teams learn about new ideas related to their businesses and operations, as well as may also identify the maturity level of the entrepreneurial ecosystem in each of their areas of interest.

The acquisition of deeper knowledge occurs in the acceleration phase of the programs, where corporations conduct proofs of concept and pilots with the startups to test their solutions and business models. As stated by one of the interviewees, this process helps the corporations to anticipate new trends and be at the forefront of innovation for their customers (*Corporation B*). In the interviews, respondents also highlighted many examples where their organizations could also gain a greater knowledge about markets that they did not know so well, which accelerated their learning curve.

5.2.2 Co-development of new products, services, and business models

All interviewees cited the co-development of new products, services, and business models as a major outcome of their corporate accelerator initiatives. The examples of co-developments with startups mentioned by them support not just their core business activities, but also their strategies to expand into new growth areas. For one of the large companies investigated, the corporate accelerator program represents one of its main strategies to create new portfolios of solutions in adjacent markets (*Corporation C*).

Respondents emphasized that the collaboration with the startups reduces development costs and time to market, as their companies would spend much more time and money developing and delivering these new solutions to the market by themselves. In some cases, besides collaborating with knowledge and experience to accelerate the development of new products, services and business models, the startups also presented themselves as a new marketing channel for the large companies to interact and acquire customers in new markets (*Corporation B and Corporation C*).

5.2.3 Gains in operational efficiency

A common outcome observed in the investigations were gains in operational efficiency from the use of the accelerated startups' solutions by the large corporations. Many startups that apply for corporate accelerators are looking for an easier way to offer their products and services to the established firms running them and thus become an official supplier. Once the startup is selected for the program, this process of becoming a supplier usually starts with a proof of concept of the solution being offer, which can evolve into a small-scale application in a given operation or department, and then to a larger scale implementation of the solution if positive results are achieved.

The examples of gains in operational efficiency found in the case analysis range from gains in administrative processes, such as procurement, where the company has employed a solution that facilitates the supplier approval process (*Corporation B*), to improvements in logistical processes, such as container stuffing, where the company implemented a startup solution that automated this process, which was previously performed manually (*Corporation D*). There were also examples related to advances in decision making, which has become faster and more accurate through the use of big data and artificial intelligence solutions applied to operations management (*Corporation A*).

5.2.4 Positive impact on organizational culture

In the multiple case study, interviewees indicated that the corporate accelerator initiatives had a positive impact on their organizational cultures. One respondent stated that the relationship with the startups through the accelerator program influenced the mindset of many of the company's executives, who became more open to risk and experimentation (*Corporation D*). Another informant mentioned that after the initiative, many business units within the organization started to make use of open innovation practices to accelerate internal innovation and develop new market opportunities (*Corporation B*).

For one of the interviewees, who manages the corporate venture capital unit of the firm, this positive impact on the organizational culture has been contributing to the

generation of new opportunities with the parent organization's business units and the startups of their portfolio (*Corporation A*). Other evidences related to this positive impact on the organizational culture could be observed by the internal processes that were improved from the learning with the startups through the corporate accelerator programs. In one of the companies, the procurement process was improved so that the company became more *startup friendly*, making it easier to contract these companies, a process called *fast-track* (*Corporation C*).

5.2.5 Positive effect on corporate image

Three representatives of the large companies under analysis highlighted that the corporate accelerator initiative had a positive effect on their corporate image, contributing to their recognition as innovative organizations by the market. These statements can be supported by the many articles and reports about the initiatives that are easily found in third party media portals, which generally take a positive view of the corporations and their open innovation strategies.

One interviewee stated that this positive perception by the market encourages other startups to want to do business with the large companies that operate corporate accelerators, as they understand that these corporations are more open to test new solutions and develop businesses with early stage ventures (*Corporation B*). Another respondent said that this positive corporate image even helps attracting new talents for the company, who see the acceleration initiatives as a good sign of an innovative organizational culture (*Corporation A*).

5.2.6 Network development

In the case studies, respondents pointed out that the corporate accelerator initiative contributed to the expansion of their corporations' network of connections. One interviewee mentioned that with the program, they began to connect not just with a larger number of entrepreneurs, but also with many mentors, specialized professionals who support the startups being accelerated on different issues, such as product development, business modeling and capital raising, which can also add value to their corporations.

Their network also expanded to other large companies and organizations, as many executives looking for benchmarking started to connect with them to learn about the corporate accelerator program (*Corporation B*).

5.2.7 Qualified investment pipeline

For one of the corporations, which in addition to the corporate accelerator also runs a corporate venture capital fund, the acceleration program is seen as a source of qualified investment opportunities for its investment pipeline, since the startups selected for acceleration may already meet a very important investment criteria, which is the strategic fit with the parent company's businesses (*Corporation A*). For *Corporation B*, which does not have a specific venture capital unit, but offered investments in exchange for equity in the startups in 7 of its acceleration batches, the program is also seen as a good source of investment opportunities. Archival data showed that *Corporation B* had invested in more than 30 accelerated startups, whereas *Corporation A* has made 2 investments in the startups that participated in its accelerator program.

5.2.8 Synthesis of the outcomes achieved by large corporations with corporate accelerators

See *Table 32* for a synthesis of the outcomes achieved by the 4 large corporations studied with their corporate accelerator initiatives.

Table 32 - Outcomes achieved by large corporations with corporate accelerators

| Outcomes | Corporation A | Corporation B | Corporation C | Corporation D |
|---|----------------------|----------------------|----------------------|----------------------|
| Acquisition of new technological and market knowledge | x | x | x | x |
| Co-development of new products, services, and business models | x | x | x | x |
| Gains in operational efficiency | x | x | | x |
| Positive impact on organizational culture | x | x | x | x |
| Network development | x | x | x | x |
| Positive effect on corporate image | x | x | x | x |
| Qualified investment opportunities | x | x | | |

Source: Author

5.3 Methods employed by large corporations to measure the value added by corporate accelerators

The multiple case analysis revealed that large corporations employ a wide variety of indicators to measure the value that corporate accelerator initiatives add to their organizations. The next sections will describe each of these indicators in more detail, relating them to the outcomes presented in *Section 5.2*.

5.3.1 Indicators related to the acquisition of new technological and market knowledge

In the investigations, 2 indicators related to the acquisition of new technological and market knowledge were identified. The first was the *number of startup applications evaluated per batch*, which indicates the breadth of knowledge that is acquired through the evaluation of the startups' applications in the selection phase of the programs. In some cases, in addition to the number of startups evaluated itself, companies also analyzed the distribution of these startups in the areas of interest of the program, which increases the understanding of how broad the knowledge being acquired is.

The second indicator was the *number of proofs of concept or pilots developed with the startups per batch*, which indicates how much in-depth knowledge has been acquired from testing the startups' solutions and technologies. As mentioned before, it is with this closer relationship that corporations can absorb more valuable knowledge and understand how the solutions proposed by the startups can contribute to the development of their businesses.

5.3.2 Indicators related to the co-development of new products, services or business models

Two indicators related to this outcome were also identified. The first was the *number of new products, services or business models developed*, which indicates the effectiveness of the initiative in boosting the company's capabilities to develop new products and services. In relation to this, some corporations also mentioned that they evaluate the *number of opportunities identified with the startups*, which is a leading indicator for the co-development of projects.

The second indicator identified was *time to market*, which measures the required time to move a product or service co-developed with the startups from conception to market. With this last metric, corporations can assess how much the delivery of new products or services to the market is accelerated when compared to the average time required through the company's internal innovation processes.

5.3.3 Indicators related to gains in operational efficiency

Respondents reported several indicators to measure gains in operational efficiency from the use of the startups' solutions. The choice of the metrics depends on the process or activity being evaluated but are usually related to the *cost effectiveness of a given operation*, the *lead time to perform a certain routine* or the *accuracy of a specific procedure*.

Examples of these metrics found in the study were the *cost effectiveness in revenue recovery*, in a case where the company was evaluating the costs effectiveness of a solution that automates the process of collecting debts from customers, the *average procurement lead time*, in a case where the corporation was evaluating whether the solution proposed by a startup could reduce the lead time of its procurement process and the *accuracy of image recognition*, in a case where the large company was evaluating the degree of accuracy of an artificial intelligence solution in recognizing text in digitalized images.

5.3.4 Indicators related to the impact on organizational culture

Four indicators related to the impact that corporate accelerators cause on the organizational culture of large companies were identified. The first two were the *number of employees impacted by the program's activities* and the *number of departments that engaged with the startups through the initiative*, measuring the reach of the program's impact on the company, the first being at the level of employees and the last at the level of the organization.

The third and fourth indicators identified were both related to the employees' experience with the program. One was the *employee satisfaction index*, a metric that

measures the contentment of the engaged workforce with the corporate accelerator, commonly evaluated with a 0-10 rating question. The last consists of an *employee experience assessment*, a qualitative survey that accelerator program managers run with the corporations' employees involved with the initiative to gather their feedback about the program. These surveys include open-ended questions that support the understanding of the employees' perceptions of the accelerators, as well as understanding how their routines are impacted by these initiatives.

5.3.5 Indicators related to the effect on corporate image

Three indicators related to the effect that corporate accelerators have on corporate image were found. The first was the *number of media mentions*, which measures how many times the company was mentioned in third-party media channels due to the accelerator initiative. With these mentions in hand, corporations also measure the *ratio of positive and negative mentions* by analyzing the sentiment of each publication. In the case analysis, one company reported a 100% positive media mentions ratio over the past 2 years running the corporate accelerator, which supports the idea that corporate accelerator programs have a positive effect on the image of the corporations running them.

The third indicator identified in the investigations was the *earned media value*, which measures the value of unpaid brand impressions in third-party media channels due to the corporate accelerator initiative. Unlike paid or owned media, earned media is a kind of organic media produced by external sources, which may include mass media channels, such as newspapers, television or radio or online channels, such as news articles or interviews for specialized portals. Established firms calculate it by valuing the cost of the publications if they were paid for, this way they can understand how much they gained in media value through the accelerator programs.

5.3.6 Indicators related to the generation of investment opportunities

As investments are not part of the main strategy of the companies analyzed with their corporate accelerators, not many indicators were found that measure the value that

these initiatives add for this particular purpose. The only reported metric related to this outcome was the *ratio of invested startups per cohort*, which is a lagging indicator that assesses if the program contributes to closing investment deals with startups.

5.3.7 Indicators related to network development

Although the development of a valuable network was highlighted by the firms' representatives as an important value generated by the corporate accelerator initiatives, no indicator related to this outcome was identified in the case analysis. One of the companies studied had a list of contacts that were made through the initiative but did not report any indicator that was constantly reviewed to measure its evolution or the impact it generates.

5.3.8 Synthesis of the methods employed by large corporations to evaluate the value that corporate accelerators add to their organizations

See *Table 33* for a synthesis of the indicators that the 4 large corporations studies employ to measure the value that the corporate accelerators add to their organizations.

Table 33 - Indicators employed to measure the value added by corporate accelerators

| Outcomes | Related Indicators |
|--|---|
| Acquisition of new technological and market knowledge | <ol style="list-style-type: none"> 1. Number of startup applications evaluated 2. Number of proofs of concept/pilots developed |
| Co-development of new products, services and business models | <ol style="list-style-type: none"> 1. Number of new products or services developed 2. Time to market |
| Gains in operational efficiency | <ol style="list-style-type: none"> 1. Cost effectiveness of a given operation 2. Lead time to perform a certain routine 3. Accuracy of a specific procedure |
| Positive impact on organizational culture | <ol style="list-style-type: none"> 1. Number of employees impacted by the initiative 2. Number of departments that engaged with the startups 3. Employee satisfaction index 4. Employee experience assessment |
| Network development | - No structured indicators found |
| Positive effect on corporate image | <ol style="list-style-type: none"> 1. Number of media mentions 2. Ratio of positive and negative mentions 3. Earned media value |
| Qualified investment opportunities | <ol style="list-style-type: none"> 1. Ratio of invested startups |

Source: Author

6 DISCUSSION

The main objectives of this research project were to identify the outcomes that large corporations achieve when engaging with startups through corporate accelerators, as well as to analyze how they measure the value that these initiatives add to their organizations. With the findings presented in the last chapter, it is possible to understand that established firms achieve diverse outcomes with this corporate-startup engagement model, observing benefits on a strategic, operational, and organizational level. It is also possible to identify that corporations employ several methods to measure the value that these initiatives add to their businesses, including quantitative indicators and qualitative assessments. The next sections will discuss these findings in more depth, making a comparison with existing literature, presenting its implications, addressing its limitations, and recommending directions for future research.

6.1 Findings interpretation

The research findings around the outcomes achieved by large corporations with corporate accelerators are in line with those highlighted by Urbaniec & Żur (2020) and Gutmann et al. (2019), who also found that these initiatives benefit the acquisition of new technological and market knowledge, accelerate the development of new products, positively influence organizational culture, enhance corporate image, and boost the development of a valuable network of contacts. In addition to these outcomes, the study also revealed that established firms can obtain gains in operational efficiency through the direct use of the startups' technologies and solutions, as well as generate qualified investment opportunities for their corporate venture capital units. These outcomes suggest that large corporations can obtain benefits on a strategic, operational, and organizational level with corporate accelerators.

Regarding the methods used by large corporations to measure the value that corporate accelerators add to their organizations, the case study findings showed that established firms employ several indicators to evaluate the performance of their initiatives and the results attained. These findings differ from the ones presented by Richter et al. (2018), who mentioned an almost complete absence of performance metrics in their

research conducted with 11 corporations. They concluded that the lack of indicators presented by their interviewees could be due to the confidentiality of the outcomes. However, another reason may be the lack of maturity of some companies regarding innovation accountability. In this case study, it became clear that more mature firms in terms of innovation employed much more metrics than the less experienced ones. The use of performance and result indicators is essential to assess whether the goals with the initiatives are being achieved, as well as to demonstrate their contribution to the rest of the organization (Kanbach & Stubner, 2016).

6.2 Research implications

The results of this research contribute to a better understanding of the corporate-startup engagement model of corporate accelerators. By describing the outcomes achieved by large corporations from different industries with these initiatives, it addresses the limitations of the studies conducted by Gutmann et al. (2019) and Urbaniec and Żur (2020), as well as it provides support to the findings presented by them with regards to the benefits for established companies. It also contributes to the progress of the study performed by Kanbach and Stubner (2016), providing evidence that can be confronted with the enterprises' strategic objectives with corporate accelerators outlined in their study, being able to understand if corporations achieve the goals they set with accelerator programs.

By presenting several indicators employed by large corporations to measure the value that corporate accelerators add to their organizations, this study fills the knowledge gap pointed out by Bauer and Obwegeser (2016), Ben Mahmoud-Jouini et al. (2018) and Gutmann et al. (2019) about this topic. Moreover, this research might also add value to executives of established firms or representatives of consulting firms running corporate accelerators, who can sharpen their strategic goals with the initiatives after a better understating of the outcomes that can be achieved, as well as to improve the accountability of their programs by employing some of the indicators described in this research project.

6.3 Limitations and directions for future research

Although this research project has achieved its objectives, there are some limitations to be noted. Firstly, due to time constraint, the sample size was restricted to only four cases. This made it more difficult to find the relationship amongst some of the findings, especially for those related to investment opportunities, since only two companies had an investment capability at the time of the data collection. Secondly, the whole data collection and data analysis were conducted by a single researcher, which can increase the risk of researcher bias. Lastly, due to the qualitative design of this study, the findings cannot be generalized for all large corporations engaging with startups through corporate accelerators.

Future research on corporate accelerators can focus on validating the results found in this study in a wider sample of large corporations to verify the reliability of our findings. A more quantitative study would also be valuable to increase the validity of the existing academic knowledge on corporate accelerators, as the literature review showed that the topic lacks such analyses. Finally, it would be also interesting to explore the complementarity of the different corporate-startup engagement models found in the literature review and understand how established firms can get the most out of each one of them (Chesbrough, 2002; Ferrary, 2011; Kohler, 2016; Kurpjuweit & Wagner, 2020; Schaeffer, 2015; Weiblen & Chesbrough, 2015).

7 CONCLUSION

This research project aimed to understand the outcomes that large corporations achieve when engaging with startups through corporate accelerators, as well as to identify the methods they employ to measure the value that these initiatives add to their organizations. Based on a multiple case study performed with 4 Brazilian established firms, it can be concluded that corporations achieve different outcomes with this corporate-startup engagement model, obtaining benefits on a strategic, operational, and organizational level. The study also revealed that corporations employ several methods to evaluate the value that these programs add to their organizations, including quantitative indicators and qualitative assessments.

The findings provide valuable insights for both scholars and professionals engaged in corporate accelerators. By exploring the outcomes achieved by large corporations through these initiatives, the study contributes to the advancement of the theory produced by other researchers on the topic (Gutmann et al., 2019; Kanbach & Stubner, 2016; Urbaniec & Żur, 2020). It also fills the knowledge gap pointed out by other academics on the methods employed to measure the value that this programs can generate to the organizations running them (Bauer & Obwegeser, 2016; Ben Mahmoud-Jouini et al., 2018; Gutmann et al., 2019). Moreover, it also provide insights to professionals from established firms and consulting companies to improve the accountability of their accelerator programs.

As with most studies, the design of this investigation is subject to limitations. First, the sample size was limited to only four cases. Second, the data collection and analysis were conducted by a single researcher, which might lead to researcher bias. At last, due to the qualitative nature of the research, the results cannot be generalized for all corporate accelerator cases.

With regards to future research, a confirmatory investigation would be valuable to validate the findings of this study. Quantitative studies about different topics of the corporate accelerator literature would also be beneficial for the advancement of the existing academic knowledge on the subject. Lastly, an analysis on the complementarity

of the different corporate-startup engagement models used by large companies to engage with startups would also be interesting (Chesbrough, 2002; Ferrary, 2011; Kohler, 2016; Kurpjuweit & Wagner, 2020; Schaeffer, 2015; Weiblen & Chesbrough, 2015).

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APPENDIX A – Data-extraction reports of the reviewed papers

| Paper | Data collection method | Research nature | Data analysis method | Research approach | Main topics covered | Main contributions and results |
|----------------------------------|------------------------|-----------------|----------------------|-------------------|---|---|
| Aernoudt and San José (2003) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate venture capital) | An analysis of how large companies invest, the size of their investments and importance in the funding chain and what can be done to increase their role in the seed investment of startups |
| Basu et al. (2016) | Interviews, Database | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate venture capital) | A framework of CVC unit search and integration processes |
| Ben Mahmoud-Jouini et al. (2018) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | An analysis of the drivers of successful corporate accelerators |
| Benson and Ziedonis (2009) | Database | Empirical | Quantitative | Confirmatory | Absorptive capacity of firms; Corporate-startup engagement models (corporate venture capital) | An analysis of how information gained through CVC investing might improve firm performance |

| | | | | | | |
|------------------------------|---------------|---------------|---------------|---------------|---|--|
| Chesbrough (2002) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate venture capital) | A framework that can help companies decide if it should invest in a particular startup by evaluating the benefits that might be realized from the investments |
| Connolly et al. (2018) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate accelerators) | An analysis of the operations of a Corporate Agribusiness Accelerator |
| Ferrary (2011) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (startup acquisitions) | An analysis of two strategies for exploring innovation in large firms: Organizational ambidexterity and exploration outsource through the acquisition and development of startups |
| Fulghieri and Sevilir (2009) | Game theory | Theoretical | Quantitative | Exploratory | Corporate-startup engagement models (corporate venture capital) | An analysis of the impact of competition on the optimal organization and financing structures in innovation-intensive industries. The main result found is that companies organizing their projects externally in collaboration with startups can obtain competitive advantage over their rivals |

| | | | | | | |
|----------------------------|----------------------|-----------|---------------------------|--------------|--|---|
| Gutmann et al. (2019) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | An analysis of the benefits of the SAP Corporate Accelerator for the parent company and for the startups accelerated |
| Hogenhuis et al. (2016) | Interviews | Empirical | Qualitative | Exploratory | Asymmetric partnerships | A decision-making model to support managers in large firms in making the right decisions around collaborations with startups |
| Hora et al. (2018) | Interviews | Empirical | Qualitative | Exploratory | Coopetition | An analysis of the causes and effects of coopetition between large companies and startups |
| Jackson and Richter (2017) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerator) | The study highlighted the contradictions and conflicts between large corporations and startups based on structural, cultural and personal ontologies. |
| Kanbach and Stubner (2016) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerator) | A typology of different types of corporate accelerators |
| Kleer and Wagner (2013) | Interviews, Database | Empirical | Qualitative, Quantitative | Confirmatory | Corporate-startup engagement models (startup acquisitions); | An analysis of the influence of firm acquisitions on the innovation output of large companies |

| | | | | | Absorptive capacity of firms | |
|------------------------------|---------------|---------------|---------------|---------------|--|--|
| Kohler (2016) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | A framework that contemplates the main strategies for designing corporate accelerators |
| Kupp et al. (2017) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate accelerators) | An analysis of the success factors for corporate accelerator programs |
| Kurpjuweit and Wagner (2020) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (startup supplier programs) | An analysis of the key elements and processes of Startup Supplier Programs |
| Lantz et al. (2011) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate venture capital) | An analysis of different types of corporate venture capitals |
| Lerner (2013) | Not available | Not available | Not available | Not available | Corporate-startup engagement models (corporate venture capital) | A list of 6 steps to help companies succeed in CVC activities |
| Michalski et al. (2006) | Survey | Empirical | Quantitative | Confirmatory | Corporate-startup engagement models (corporate venture capital); Absorptiv | An analysis of the success factors of corporate venturing |

e capacity
of firms

| | | | | | | |
|---------------------------------|----------------------|-----------|--------------|--------------|---|---|
| Minshall et al. (2008) | Interviews, Survey | Empirical | Qualitative | Exploratory | Asymmetric partnerships | An analysis of the needs of large companies and startups regarding a practitioner guide for asymmetric partnerships |
| Minshall et al. (2010) | Interviews | Empirical | Qualitative | Exploratory | Asymmetric partnerships | An analysis of the common challenges surrounding corporate-startup partnerships, as well as practical solutions drawn from case studies |
| Mohamed and Schwenbacher (2016) | Database | Empirical | Quantitative | Confirmatory | Corporate-startup engagement models (corporate venture capital) | An analysis of the drivers of corporate venture capital announcements |
| Moschner et al. (2019) | Interviews, Database | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | A typology of 4 different models of corporate accelerators |

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|------------------------------|----------------------|---------------|---------------------------|---------------|---|--|
| Napp and Minshall (2011) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate venture capital) | An analysis of the challenges surrounding corporate venture capital units, as well as practical solutions drawn from case studies |
| Olleros and Macdonald (1988) | Not available | Not available | Not available | Not available | Strategic alliances | An analysis of the benefits for large companies engaging in strategic alliances |
| Richter et al. (2018) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | An analysis of the key features of corporate accelerator programs |
| Rothaermel (2002) | Database, Interviews | Empirical | Qualitative, Quantitative | Confirmatory | Strategic alliances | An analysis of how incumbent pharmaceutical companies go about selecting alliance partners from the population of new biotechnology startups |
| Schaeffer (2015) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (startup contests) | An analysis of the strategic basis and mutual benefits for large companies and startups involved in startup contests |
| Shankar and Shepherd (2019) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | An analysis of 2 different types of corporate accelerators |

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| Smith and Sfekas (2013) | Database | Empirical | Quantitative | Exploratory | Corporate-startup engagement models (corporate venture capital); Intellectual property | An analysis of the contribution of physician-founded startups to incumbent medical device manufacturers |
| Urbaniec and Zur (2020) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate accelerators) | An analysis of the motives, challenges and barriers associated with corporate accelerators |
| Weiblen and Chesbrough (2015) | Interviews | Empirical | Qualitative | Exploratory | Corporate-startup engagement models (corporate venture capital; corporate accelerators; platform startup programs) | A typology of corporate engagement models with startups and their key objectives. |

Source: Author