



IRIS Utrecht presenteert:

A Comparative Study of the Business Incubation and Corporate Entrepreneurship Processes in the Context of Smart City Innovation

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Achtergrond/context van het rapport of product:

Because of urbanization and the pressure on the quality of life in cities that comes with it, it is relevant to know how smart city initiatives can be encouraged. This thesis compares business incubation and corporate entrepreneurship in the context of smart city innovation.

Kernvraag:

How does the process of business incubation differ from the process of corporate entrepreneurship in the context of Smart Cities?

Samenvatting/opbrengst:

In the recent years, entrepreneurship under guidance and support, i.e. business incubation and corporate entrepreneurship, has become an especially attractive, widespread way of fostering Smart City innovation. These processes share many similarities in the way the parenting entity steers participants toward success, yet they remain inherently different. This paper draws upon the existing literature and provides a comparative study of business incubation and corporate entrepreneurship in the Smart City sector. The results indicate that these processes follow the same four-step model: envisioning, product championing, steering, and accelerating. The differences between the two processes with regards to this four-step model are found in the resources and value-adding activities used to steer the participants. Based on these findings, the study offers recommendations to practitioners as well as new directions for future research.

Tags:

Corporate Entrepreneurship; Business Incubation; Smart City

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Master Thesis U.S.E.

A Comparative Study of the Business Incubation and Corporate Entrepreneurship Processes in the Context of Smart City Innovation

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Abstract:

In the recent years, digital transformation along with increasing urbanization levels created incentives for both incumbent and novel organizations to provide innovative solutions in the Smart City sector. Guided entrepreneurship has become an especially attractive, widespread way of fostering innovative business ideas in modern cities. The extant literature presents two main process models of entrepreneurship under guidance and support: business incubation and corporate entrepreneurship. These processes share many similarities in the way the parenting entity steers participants toward success, yet they remain inherently different. This paper draws upon the existing literature and provides a comparative study of business incubation and corporate entrepreneurship in the Smart City sector. The results indicate that these processes follow the same four-step model: envisioning, product championing, steering, and accelerating. The differences between the two processes with regards to this four-step model are found in the resources and value-adding activities used to steer the participants. Based on these findings, the study offers recommendations to practitioners as well as new directions for future research. Companies engaged in guided entrepreneurship are advised to provide coaching and mentorship to their participants, along with a separately located facility to accelerate innovation development and enhance creativity in a helpful peer environment. Furthermore, attention should be paid in corporate bottom-up initiatives to ensure fit of the project with the mother organization's overall strategy. Lastly, governments are advised to take steps toward removing barriers to entry in the Smart City sector related to uncertainty about the added value of innovation.

Keywords: Corporate Entrepreneurship, Business Incubation, Smart City

JEL codes: M13, O18, O31

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1 Introduction

Urbanization and digital transformation have been the defining features that shape today's society and its recent developments (Dunleavy et al., 2005; Kotzeva et al., 2016). Innovation is a priority in the digital transformation efforts (Iansiti & Lakhani, 2014).

In order to survive in this fast-paced environment, organizations are required to develop new innovation capabilities (Nambisan, Lyytinen, Majchrzak, & Song, 2017). However, innovation management and planning methods such as Cooper's Stage-Gate process are no longer effective in keeping up with the recent developments (Ovesen, 2012; Smith, 2007) and corporations are therefore forced to adopt more agile- or lean-oriented innovation approaches (Meyer & Marion, 2010). Especially in the recent years, the gap between the startup and corporate innovation methodologies has been steadily narrowing down (Weiblen & Chesbrough, 2016). The extant literature has only recently begun to explore the modern methods that corporations use. Incumbents often use models that were initially developed for startup development such as business incubation, acceleration, hackathons, The Lean Startup methodology by Ries (2011), and other, and transform them into corporate entrepreneurship models (Edison, Smørsgård, Wang, & Abrahamsson, 2018; Fecher, Winding, Hutter, & Füller, 2018; Heikkinen, Belt, Mottonen, Harkonen, & Haapasalo, 2020).

As shown in the literature review of this thesis, the process of corporate entrepreneurship indeed is similar to such startup-oriented approaches, especially the process of business incubation. They both exhibit a similar guided innovation approach in which a nascent business unit is steered toward successful innovation by a guiding (parenting) organization (for example Burgelman, 1983a; Campbell, Kendrick, & Samuelson, 1985; Heikkinen et al., 2020). Because of the close connection between these two processes, it is essential for academics to understand their

differences connected to the inherent nature of corporate versus individual entrepreneurship (Sharma & Chrisman, 1999). Moreover, the current process models in the corporate entrepreneurship literature fail to include innovation labs and similar internal development models inspired by business incubation and academics are encouraged to further explore these emerging areas of corporate innovation (Fecher et al., 2018) in order for the theory to accurately represent the status quo. Thus, this study aims to answer the following research question: How does the process of business incubation differ from the process of corporate entrepreneurship?

In the interest of a narrowing the scope of analysis and increasing the potential of providing industry-specific contributions, this thesis is set into the context of Smart City innovation. Urbanization has been continuously increasing over the last few decades, reaching over 70% in certain European and Asian countries. These developments pose significant challenges on modern cities, such as overconsumption of non-sustainable resources, aging population, new cultural shifts, and deteriorating social cohesion (Cohen, 2006; Kourtit, Nijkamp, & Arribas, 2012). In the recent years, the concept of Smart City has gained attention across many countries of the EU as a prospective solution to such urbanization-related problems. Although the current literature lacks consensus on the exact definition of Smart City (Yigitcanlar et al., 2018), the general agreement is that such cities commonly use modern technologies such as information and communication technology (ICT) or internet of things (IoT) to respond to the above-mentioned challenges (for example Albino, Berardi, & Dangelico, 2015; Cocchia, 2014; Yigitcanlar et al., 2018). Furthermore, Smart Cities depend on their knowledge and competitive resources to maximize their innovation potential (Kourtit et al., 2012). There are various ways in which Smart Cities aim to foster innovation which commonly involve multiple interdisciplinary stakeholders at once. These include for example public-private partnerships (PPP), a variety of startup support systems

(for example technology-based incubators), or supportive public policies (Lea, Blackstock, Giang, & Vogt, 2015; Nielsen, Baer, & Lindkvist, 2019). These efforts exhibit slightly different means and measures of supporting businesses with varying micro-goals. According to several studies (Christiansen, 2014; Dutt et al., 2016; Gonzalez-Uribe & Leatherbee, 2018; Leblebici & Shah, 2004; Phan, Siegel, & Wright, 2005; Salido, Sabas, & Freixas, 2013), business incubation is different from a general policy in several ways – it is more flexible and selective (for example, it can target a chosen business and offer tailored support), and it actively mediates the business' development as opposed to passive or indirect support. As a result, incubation has become an attractive, widespread way of fostering innovative business ideas in modern cities.

By exploring the process of guided innovation in both startup and corporate settings in the Smart City sector, this paper has the potential of contributing not only to the entrepreneurship literature, but also to provide further insights in the novel concept of Smart City. Furthermore, the comparative study will allow for direct recommendations to practitioners, such as corporate innovation managers, business incubation managers, and policy makers.

The paper is organized as follows: section 2 draws upon a brief review on recent developments in the entrepreneurship and innovation management literature and provides insights on business incubation and corporate entrepreneurship literature streams. The section concludes in a literature review of both process models and introduces a common framework used for the empirical analysis. Section 3 introduces the strategy for empirical analysis and describes the applied research method and procedures. Section 4 presents the results and analyzes the differences between the two observed processes. In section 5, the results are discussed within the context of existing theory and translated into practical recommendations. Finally, this section describes the

main limitations of the study and links them along with the main contributions to areas of future research.

2 Literature Review

This section provides definitions and insights into the theory of business incubation and corporate entrepreneurship, respectively. Furthermore, an overview of existing scholarly research, namely frameworks and process models for both of the processes are presented, concluding in a synthesis of these frameworks.

This paper is mainly considered with entrepreneurship, both independent and corporate. According to Sharma & Chrisman (1999), “entrepreneurs are individuals or groups of individuals, acting independently or as part of a corporate system, who create new organizations, or instigate renewal or innovation within an existing organization” (p.17).

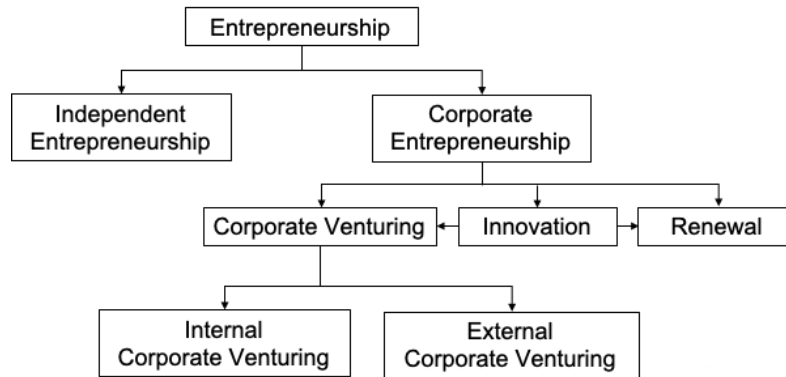
2.1 Corporate Entrepreneurship

In corporate settings, innovation may take various forms in terms of origins and structure. Sharma & Chrisman (1999) propose a framework where innovation originates in corporate entrepreneurship via three categories: corporate venturing, innovation and renewal (Figure 1). However, they stress that even more specific phenomena like internal corporate venturing do not occur in an unambiguous form. In other words, the resulting innovations and new business units may vary largely in their origins, the way they are developed, and in the final structural form they take. Zahra (1995) defines corporate innovation as the following:

“... innovation involves creating and commercializing products and technologies, providing financial and human resources for innovative projects, and maintaining an appropriate infrastructure for innovation. Renewal means revitalizing a company's business through innovation and changing its competitive profile. Venturing requires creating and nurturing new business in current and new industries” (p. 227).

Furthermore, corporate innovation can originate both bottom-up via autonomous strategic behavior (otherwise also called intrapreneurship) and top-down via induced strategic behavior, for example strategic management decisions and similar (Burgelman, 1983b; Lumpkin & Dess, 1996).

Figure 1: Hierarchy of Terminology in Corporate Entrepreneurship (Adapted from Sharma & Chrisman, 1999)



However, today's dynamic market conditions pose challenges on incumbent businesses to adjust quickly to new developments and respond to innovative business opportunities (Ovesen, 2012). Many existing organizations have adopted modern methodologies that are more agile- or lean-oriented in contrast to the traditional waterfall or stage-gate process (Smith, 2007). This resulted in emergence of a variety of new formats such as hackathons, lean startup camps, jams, corporate accelerators, or corporate incubators (Fecher et al., 2018). One of these formats is a so-called innovation lab, an independent organizational structure that aims to enhance creative behavior and facilitate innovation and business development (Christensen & Overdorf, 2000; Leminen, 2015; Lewis & Moultrie, 2005; Magadley & Birdi, 2009). Comparable to a business incubator, an innovation lab promotes the learning ability to cope with the digital transformation of the organization and the individuals within, while helping them to identify new business opportunities (Carlsson, Jacobsson, Holmén, & Rickne, 2002; Meyer & Marion, 2010).

2.2 Business Incubation

According to a review by Hausberg & Korreck (2020), are organizations aimed at supporting the establishment and growth of new businesses with a variety of tangible and intangible resources during a flexible period. Similarly, a report by the European Union (European Commission, 2002) defined business incubation as a dynamic process of young business development that helps startups survive and grow in the early stages. Incubators provide support such as hands-on management assistance, access to financing, exposure to business or technical support services, and access to office space and equipment. Similar definitions by Fehder & Hochberg (2014) and Madaleno, Nathan, Overman, & Waights (2018) state that business incubation is a tool for stimulating the development of startups (early-stage, innovative businesses) that has become a wide-spread and continuous trend. A more hands-on explanation of the concept was proposed by Hackett & Dilts (2004b): “A business incubator is a shared office-space facility that seeks to provide its incubatees (i.e. ‘portfolio-‘ or ‘client-‘ or ‘tenant-companies’) with a strategic, value-adding intervention system (i.e. business incubation) of monitoring and business assistance” (p. 41). Incubators are apt to incubating intermediate ventures in their early development stages; they do not have the capacity to grow a new venture from scratch, as the media often presented it in the 1990s (Hackett & Dilts, 2004a).

University incubators or similar regional business incubators commonly serve a local or scientific community and fulfill primarily a public mission. On the other hand, independent commercial incubators or virtual incubators are directed towards making profits (Hausberg & Korreck, 2020). Although business incubators often collaborate with a network of investors, capital investment is not the primary goal of business incubation. It is the objective of business

accelerators to allow entrepreneurial ventures to access resources of investors and other stakeholders (Malek, Maine, & McCarthy, 2014).

2.3 Toward a common process model

This section presents an overview of previously established scholarly frameworks on the processes of business incubation and corporate entrepreneurship. The extant literature does not offer a common framework that encompasses both these forms of innovation. This section therefore provides a literature review of existing process models (Table 1) and ends with a synthesis and comparison of the existing models that will serve as guideline for empirical analysis.

Business Incubation

Although many scholars have studied business incubation in the past, the current level of understanding of this process is not unanimous. This is possibly due to the idiosyncrasies of the various forms of business incubation and related terms, such as incubators, accelerators, science parks, technology parks, innovation centers etc., when observed with regard to geographic, economic, cultural, political and social systems (Phan, Siegel, & Wright, 2005).

One of the first process models for business incubation was introduced by Campbell et al. (1985). This model includes four basic “services” (value addition activities) by which an incubator contributes to the performance of incubated firms: diagnosis of needs, election and monitoring, capital investment, and access to expert networks. Ayatse, Kwahar, & Iyortsuun (2017) pointed out limitations to this framework: the model does not account for entrepreneurial capability, the strengths and shortcomings of the ecosystem, and the adopted selection criteria; it is based on the assumption that all incubated ventures will survive. A model by Smilor (1987) was built on the framework proposed by Campbell et al. (1985) and has extended it by putting more emphasis on the external environment (incubator affiliation and support systems) relative to the internal

activities of an incubator. This framework describes the process as a combination of internal support services and external networks that allow for the formation of new ventures to reach higher objectives of technology development. Nevertheless, unlike Campbell et al.'s (1985) framework, this model merely describes the internal support systems, failing to address the actual processes occurring within the incubator.

Another process model was defined by Hackett and Dilts (2004a, 2004b) based on their systematic review of business incubation research. Drawing on the Campbell et al.'s (1985) focus on value adding activities, this model acknowledges the same elements of the incubation process: new venture selection, monitoring and assistance, and resource infusion. The model is unique in that it uses the 'black box' principle for describing the internal process of business incubation.

Corporate Entrepreneurship

Similar to business incubation, the various processes of corporate entrepreneurship have been studied abundantly over the years. Arguably, there are subcategories of corporate entrepreneurship to be studied as individual processes (Sharma & Chrisman, 1999), however, as will be shown below, these approaches exhibit similar steps when it comes to process modeling and often fail to account for specific resources and practitioners' methodologies.

According to a study of internal corporate venturing in diversified major firms (Burgelman, 1983a), there are two core processes of internal corporate venturing: definition (articulation of the technical-economic aspects) and impetus (attaining and preserving support in the organization). The author emphasized that internal venturing takes shape in the strategic and structural contexts within the corporation. In other words, the new venture is influenced by various organizational and administrative mechanisms that support the current corporate strategy on the operational and middle managerial level. The current corporate strategy often needs to be extended or adjusted to

accommodate the new business activities of an internal venture that has fallen outside its scope. The model accounts for different stages of the process, from a process of linking solutions with problems and needs, to project championing, and to the impetus process which is composed of strategic forcing and strategic building.

However, there has been a shift in the approach to corporate innovation over the last few decades. In the recent years, the Lean Startup methodology by Ries (2011) has become popular not only on the startup scene, but also in the corporate innovation context. In its essence, it is a hypothesis-driven approach that aims at achieving a product-market fit¹. Edison (2015) proposed a conceptual framework for the lean internal startup and tested it empirically (Edison et al., 2018). This framework uncovered three main phases: envisioning, steering and accelerating. In the first stage, a vision of the future venture is created using necessary support systems from the corporate management – authorization and coaching. In the steering process, otherwise also called impetus process, the idea is (in)validated in an iterative process based on the build-measure-learn cycle (Ries, 2011). The corporate management monitors the progress of the innovation team during each cycle. In the last stage, steering, the intrapreneurs aim to scale their project to a viable product or service, while aligning their goals with the corporate strategy. Sometimes the intrapreneurs must convince the corporate management to change their strategy to accommodate the new business.

Incumbents often use similar procedures without linking them consciously to The Lean Startup methodology. An example of this is presented in a study of the innovation process in established companies by Heikkinen et al. (2020). There, the process is described as a sequence of idea generation, proposal preparation and idea verification with an optional trial at the end. This

¹ “Product/market fit means being in a good market with a product that can satisfy that market” (Andreesen, 2007).

approach is similar to the above-mentioned framework in many ways, although it does not mention the iterative process when validating an idea.

Innovation labs are a recent popular phenomenon in the corporate innovation area. However, the current literature does not provide a process model for this novel concept. A study by Fecher et al. (2018), while not providing a process model to follow, does propose three distinct phases: a pre-lab phase (1), in which organizations make decisions on time, talent, and tasks, a lab phase (2), where research, ideation, and prototyping take place, and a post-lab phase (3), where the innovative project gets prepared for transfer reintegration to the business line. According to Memon & Meyer (2017), an innovation lab commonly comprises three components: a physical space, resources, and facilitation.

Table 1: Literature Review of Business Incubation and Corporate Entrepreneurship Process Models

Process	Author(s)	Research Outcome
Business Incubation	Campbell et al. (1985)	A Process Model of Business Incubation
	Smilor (1987)	A Process Model of Business Incubation; Success Factors
	Hackett & Dilts (2004a, 2004b)	A Real Options-Driven Theory of Business Incubation
	Phan et al. (2005)	Science Parks and Incubators: Observations, Synthesis and Future Research
	Ayatse et al. (2017)	The Business Incubation Process and Firm Performance
Corporate Entrepreneurship	Burgelman (1983a)	A Process Model of Internal Corporate Venturing in the Diversified Major Firm
	Edison (2015), Edison et al. (2018)	A Conceptual Framework of Lean Startup; Lean Internal Startups for Software Product Innovation in Large Companies
	Fecher et al. (2018)	Innovation labs from a participant's perspective
	Heikkinen et al. (2020)	Managing radical innovations in established companies

The Common Process Model

A synthesis of the existing models suggests that there are many similarities between the two processes in terms of their chronological phases, and that a comparative study can be performed when it comes to resources and methodologies used by practitioners (see Figure 2). Both the corporate entrepreneurship and business incubation processes begin with a form of envisioning, when a new innovative idea is born through processes such as linking a solution to a need or problem and keeping an idea backlog. For business incubation, envisioning is present in an independent venture or carried out by an entrepreneur. In corporate settings, it is usually the presence of entrepreneurial orientation² that fosters intrapreneurial behavior. In some cases, the external environment of an incumbent firm (market, governmental policy or similar) requires a new corporate strategy that leads to a top-down decision to innovate (Blank, 2013; Burgelman, 1983b; Edison, 2015; Edison et al., 2018; Lumpkin & Dess, 1996; Ries, 2011).

Next, product championing takes place. This involves pitching the idea to either the incubator representatives or to the corporate management or in the case of top-down innovation, selecting and appointing the project manager (Burgelman, 1983a, 1983b; Campbell et al., 1985; Edison et al., 2018; Hackett & Dilts, 2004a; Heikkinen et al., 2020).

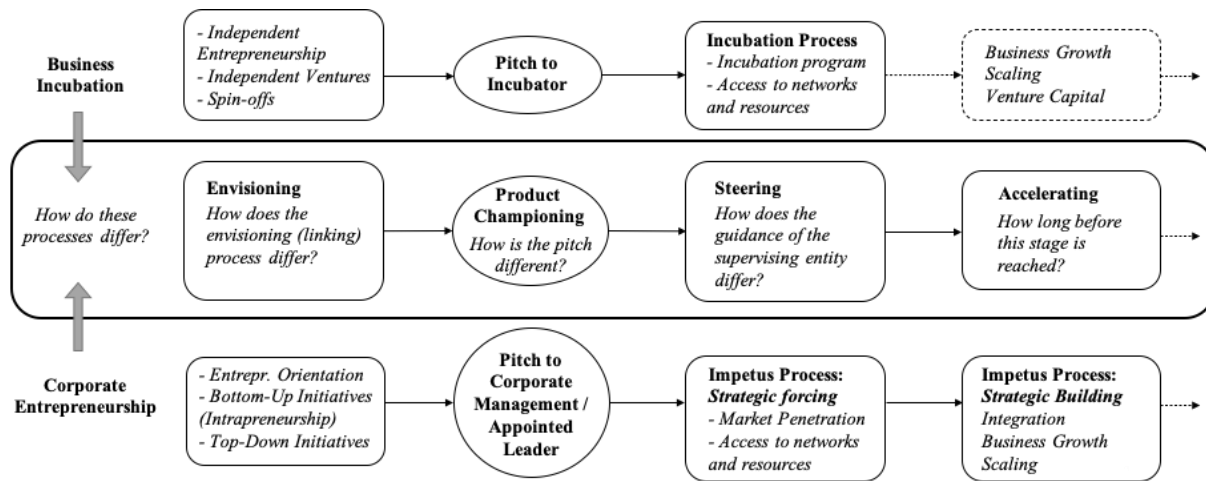
After delivering a successful pitch, the idea is transformed into a project or new venture and the steering process of new business development begins. Here, the independent venture enters the incubation program and the nascent corporate innovation unit begins the so-called impetus process. In both cases, the embryotic business unit is monitored, gains access to coaching, external

² “Entrepreneurial Orientation refers to the processes, practices, and decision-making activities that lead to new entry” (Lumpkin & Dess, 1996, p. 136). New entry is the act of creating a new venture, either by a startup or by an incumbent firm (Burgelman, 1983a).

network and other non-financial and financial resources (Burgelman, 1983a; Campbell et al., 1985; Edison et al., 2018; Hackett & Dilts, 2004a).

The steering phase is over once the new venture starts concentrating on growing and scaling, as well as attracting venture capital. For the independent venture, this stage usually begins after exiting the business incubation program. Some startups then enter an acceleration program which guides them in their growth phase and connects them to investors. In a corporation, the innovative project becomes a multifunctional business unit that is part of the overall corporate strategy (Burgelman, 1983a; Campbell et al., 1985; Edison, 2015; Edison et al., 2018; Smilor, 1987).

Figure 2: Common Framework for Business Incubation and Corporate Entrepreneurship



As demonstrated in Figure 2, both processes follow similar steps that can be summed into four phases: envisioning, product championing, steering and accelerating. This study aims to find and describe the differences between the two processes, using the four phases as common guiding criteria for the comparison.

3 Empirical Strategy

This thesis is a study of two processes comparing their differences and similarities. Academics who have conducted research on a business-related process, such as the Fairphone case study by Akemu, Whiteman, & Kennedy (2016), or Burgelman's (1983) process study of corporate entrepreneurship, chose qualitative research methods to observe the process in time. However, the scope of this thesis does not allow for a longitudinal study. Therefore, a qualitative multiple-case study approach was chosen as the best way to arrive at an encompassing view of both processes. Interviews conducted with individuals who can provide a detailed account of past events were chosen as a suitable alternative (Yin, 2013). This approach makes it possible to understand the process at the desired level of detail (Gephart, 2013) and allows to make a theoretical contribution in the emerging areas (Eisenhardt, 2016).

The study is set into the context of Smart City innovation. Choosing this novel area of innovation allows make an industry-specific contribution to a developing phenomenon. Smart City is especially unique in the way it connects the public and private sector. The following section describes the development and characteristics of Smart City.

3.1 Contextual Background: Smart City

In today's world, urbanization has become a dominant feature of settlement, reaching over 70% in some European and Asian cultures. Throughout the historical development of human settlement, we have witnessed a number of so-called revolutions in the way humans take up residence, such as first urban developments in antiquity or the Industrial Revolution. A more recent transformation happened in the post-World War II period as cities expanded not only in size but also in their function and position in the economy. This last revolution is what shapes today's urban culture; cities generate their own strength and outreach – all thanks to their own innovative

and creative potential (Kourtit, Nijkamp, & Arribas, 2012). These developments pose significant challenges for modern cities to find sustainable ways of (re)producing and consuming energy, organizing urban mobility and urban planning (Cocchia, 2014; Kourtit et al., 2012). Generally, Smart Cities use modern technologies such as information and communication technology (ICT) or Internet of Things (IoT) to respond to these challenges (Yigitcanlar et al., 2018). Examples of topics addressed by such cities are energy transition, digitalization of assets (for example digital twin creation for mobility infrastructure), or citizen co-creation. In the recent years, the concept of Smart City has gained attention across many countries of the EU. Even on a global scale, governments have been seen to foster Smart City development by introducing regulatory policies, strategically investing or by offering relevant tenders (Alawadhi et al., 2012; Anthopoulos, 2015). Smart Cities depend on their knowledge and competitive resources in order to maximize their innovation potential (Kourtit et al., 2012). Innovation in this sector is therefore inherently different to other sectors. Lombardi, Giordano, Farouh, & Yousef (2012) introduced a modified version of a triple-helix model of Smart City (Leydesdorff & Deakin, 2011), sometimes also called the quadruple-helix model, which represents a reference framework for analyzing knowledge-based innovation systems. According to this framework, there are four main agencies of knowledge creation in the Smart City sector: universities, industry, government, and civil society. This framework suggests that Smart City innovation can be initiated by different actors. At the crossing of the four proposed agencies lie the entrepreneurial and corporate ventures aiming at Smart City solutions, and receive support from governments, educational institutions and private parties (Lombardi et al., 2012).

However, the concept of Smart City has not yet been empirically defined or categorized in the academic literature sufficiently enough (Anthopoulos, 2015; Yigitcanlar et al., 2018) to apply

a specific framework on the data selection efforts of this thesis. There have been several attempts at categorizing or benchmarking Smart Cities (for example Bosh et al. (2017), Giffinger et al. (2007), or Yigitcanlar et al. (2018), but never at categorizing Smart City-oriented organizations. For example, according to Kourtit et al. (2012), certain quantitative criteria must be met by the city in order to qualify as a Smart City. Such indicators ought to be measurable, comparable, transferable and consistent over all relevant cities (a proposed source of these indicators is EUROSTAT). Nevertheless, a review done by Albino, Berardi, and Dangelico (2015) reveals, that the meaning of the term is location-nonspecific and multi-faceted: any Smart City assessment needs to account for the individual differences of each city (i.e. visions and priorities for achieving their objectives) as well as for different ranking systems. The authors conclude that “cities can be considered “smart” by reviewing definitions, components, and measures of performance of cities” (p. 18). An example of how this approach can be applied in practice is the IRIS project³ which includes several European cities, their municipalities, academic institutions as well as a number of private organizations in collaboration. The initiatives that are considered “smart” are categorized into five transition tracks, such as flexible energy management and storage, intelligent mobility solutions, or citizen engagement and co-creation, which together represent a framework that allows each city to address both common and district-specific challenges (The IRIS Smart Cities Consortium, 2017). Several partner organizations that collaborate in the IRIS project were therefore chosen as interviewees for this research.

At the time of data collection for this research, there was no existing categorization method for Smart City organizations available, leaving the selection of interviewees open to subjective

³ IRIS is a HORIZON 2020 EU funded project. Each city that takes part in the project, sets in motion a mix of universities and research organizations, local authorities, innovation agencies and private expertise to accelerate entire communities to adopt ambitious energy, mobility and ICT initiatives. More information at: <https://irissmartcities.eu/>

interpretation by the researcher. Nevertheless, during the analysis of collected data, a working paper by Hermse, Nijland, & Picari (2020) became available. It presents a Smart City Index (SCI) for classification of Smart City startups on a scale from 0 to 6 based on two necessary conditions, ‘Technology’ and ‘City’ and a number of intensity conditions. The SCI was used retrospectively

3.2 Data Collection and Description

As recommended by Yin (2013), the proposed framework served as a guide in the sampling process. Two groups of interview candidates were contacted for the purpose of this research: individuals who took an active part in business incubation (mainly startup founders) and individuals who took part in an innovative project within an existing company. Further details of each group samples are described in following sections below.

Data were collected from April to June 2020, coinciding with the COVID-19 outbreak in Europe, which caused all research-related communication and data collection efforts to be performed digitally. In total, 15 semi-structured interviews (with 16 individuals) from 13 organizations situated in the Netherlands were conducted. All interviews were conducted in English via an online video call and recorded for the purposes of transcription, ranging from 30 to 70 minutes in length. In order to keep the promise of confidentiality, none of the interviewees nor the organizations of their employment are specified by their name in this thesis.

A semi-structured interview guide was created prior to interviewing based on the proposed framework (see appendix 7.1) and reviewed by a senior researcher. This guide was adjusted throughout the process as emerging themes and missing information were exposed by the initial interviews (Gioia, Corley, & Hamilton, 2013; Yin, 2013). Any further required information was acquired from the interviewees ex-post via e-mail.

The following sections discuss the sampling and data collection for the business incubation and corporate entrepreneurship processes respectively.

Business Incubation

In order to obtain an objective account of the process of business incubation, eight interviews were conducted at UtrechtInc, a business incubator located at the Utrecht University science park. Seven interviews were conducted across five startups with the founders or business partners who participated in the incubation program, and one interview was conducted with an UtrechtInc manager (Table 2). Obtaining information about the process from the manager as well as the incubated firms increases objective accuracy and allows for comparison of how the program is organized and how it is structured in practice. In order to account for slight varying approaches of different incubation programs, startups from all three programs offered by UtrechtInc⁴ were chosen.

Table 2: Interviewees for the Business Incubation Process

	Organization	Interviewee	Smart City Index	Incubation Program
1	Business Incubator	Incubator Manager	-	-
2	Startup 1	Startup Founder	5	Tech Validation
3	Startup 2	Startup Founder	4	Student Validation
4	Startup 3	Startup Founder	2	Tech Validation
5	Startup 4	Startup Founder	0	Scientific Validation
6		Business Partner		
7	Startup 5	Startup Founder	0	Tech Validation
8	Startup 6	Startup Founder	0	Tech Validation

Smart City innovation was taken into account in the selection process. As mentioned in the section above, there was no existing method of categorizing Smart City startups available at the

⁴ <https://utrechtinc.nl/validation/>

time of data collection and selection of interviewees was made based solely on the views of the researcher and a senior academic. The Smart City index (Hermse et al., 2020) was applied during the analysis of collected data. Out of the six startups interviewed, three did not satisfy the necessary condition of ‘city’ – an urban challenge. However, considering that the goal of this study was to get a detailed account of the business incubation process in comparison to corporate venturing and the SCI was still subject to a working paper, these observations were not omitted. Furthermore, all three startups in question satisfied the other necessary condition, ‘technology’, as well as a number of intensity conditions of SCI. The remaining startups satisfied the criteria with SCI scores 5, 4 and 2.

Corporate Entrepreneurship

In order to obtain a detailed account of the process of corporate entrepreneurship, incumbent companies with 100 and more employees were contacted in the first round of obtaining interviewees. Companies that are partners in the IRIS Smart City project⁵ were chosen for the initial sample, thus ensuring contextual fit for this research. Similarly to business incubation sampling, the SCI was used ex-post to validate this selection (see Table 3) The nature of Smart City innovation (namely, the quadruple-helix) required inclusion of various interdisciplinary stakeholders, including for example a scale-up that fosters innovation in the Dutch Smart City ecosystem.

A major benefit of this data collection strategy combined with the strong networking component of Smart City was that it was possible to interview more people than originally planned. Several interviewees were willing to share contacts for new interview candidates in their network

⁵ Utrecht University is part of the EU IRIS Smart City project and provided contacts for potential interview candidates. More about IRIS at <https://irissmartcities.eu/>

outside of the IRIS project. In total, nine individuals from organizations situated in the Netherlands were interviewed for this part of data collection (Table 3); one observation was omitted due to a framework misfit. When possible, multiple staff members involved in innovation within one company were interviewed, allowing for deeper understanding of the various approaches to innovation and helping to avoid personal bias.

Table 3: Interviewees for Corporate Entrepreneurship Processes

	Organization Description	Interviewee	Relatedness of Innovation to Smart City (as described by interviewee)	SCI	Organizational Structure of Innovation (as described by interviewee)
9	Telecom Operator	Director of Smart City Program	Smart City	6	Internal Corporate Venture
10	Engineering and Consultancy Firm	Consultant, Product Dev. Manager	Smart and Healthy Cities	6	Internal Corporate Venture
11	Infrastructure and Logistics Data Platform Provider	CEO	Smart City	6	Scale-Up
12	Asset Design and Consultancy Firm	Senior Consultant	Digitalization in Asset Management	5	Business Development Project
13		Intern	Digital Twin Creation		Business Development Project
14		Innovation Program Manager	Asset Design, Operations		Innovation Lab
15	Energy Distributor	Innovation Lead	Energy Transition	5	Innovation Lab
16	Construction Firm	Business Development Manager	Smart Mobility	6	Innovation Department

3.3 Data Analysis

This section describes the process of analyzing the collected data and how the results and conclusions were drawn.

First, all interviews were transcribed using an online audio-to-text tool, Temi. The text was subsequently manually edited to account for occasional poor audio quality or verbal inaccuracies. This transcription was later used for the coding process, which was performed using the software NVivo. Each of the two processes were coded in a separate file. The first interviews were

transcribed and coded before the rest was conducted (as suggested by Langley, 1999; Lincoln & Guba, 1985; Locke & Golden-Biddle, 1997), allowing to uncover emerging key concepts and pivotal findings useful for the data collection and analysis process.

To begin with, the interviews were coded applying a bottom-up axial coding approach (Corbin & Strauss, 1998). Passages that described the process relevant to the research question were assigned a ‘code’ that was similar to the interviewees’ own words. These codes were then further categorized into higher order codes based on their logical meaning or chronological succession (Gioia et al., 2013). This approach uncovered the main themes and steps in both processes objectively, without regard to the proposed framework, allowing to account for possible differences between the theory and the status quo in practice. Higher order codes were later divided into clusters according to how the process of incubation evolved over time. These clusters were then compared to the stages in the proposed framework (i.e. envisioning, championing, steering, accelerating) using a top-down coding approach. In order to achieve accurate and complete interpretation of the data, the interview reports were constantly triangulated, while also taking the extant theory into account.

4 Results and Interpretation

4.1 Business Incubation

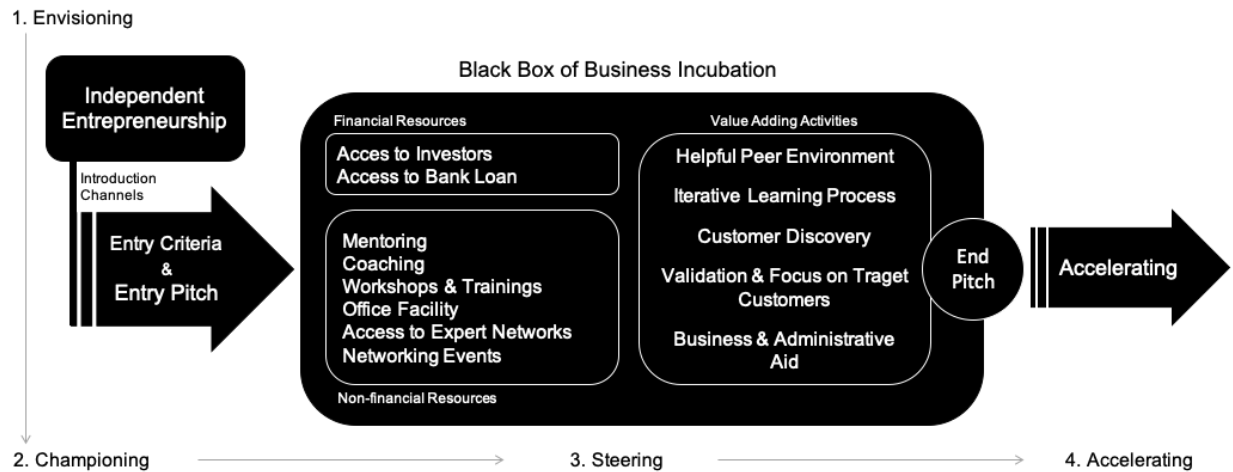
This section presents the results of data analysis for the business incubation process (see Figure 3). The data is presented in the four chronological clusters:

- i. envisioning,
- ii. championing,
- iii. steering, and
- iv. accelerating.

For each section, a description of the most frequent and most relevant codes is provided.

For a detailed coding scheme visualization of this process, see appendix 7.2.

Figure 3: Resulting Process Model of Business Incubation



i. Envisioning

The first step of the proposed framework is an envisioning phase. The most important finding is, that the incubator did not play any role in the ideation process in all cases. The data also shows various origins of innovation, such as user entrepreneurship, an employee's side project and subsequent independent entrepreneurship, and an academic research project that resulted in a spin-off. When it comes to the stage of the startup before incubation, there was no unified pattern discovered. Three of the six startups already started their sales cycle beforehand, three (incl. some of those who had already begun sales) have created a prototype, and one did not yet reach either. All founders had relevant background that allowed them to innovate in their area, however, two reported a lack of relevant experience.

ii. Product Championing

The product championing stage is where the potential incubatee(s) undergo the selection process. The data shows various introduction channels to the incubator, most frequently through the university, via an event at the incubator, or internet search. The incubator proposed clear criteria to enter by first asking the startup to submit a “one pager”, a document containing relevant entry requirement information: “... it has a problem description, solution description and then very briefly how you intend to provide value, who the customer is, what stage you’re in and some more information on the team” (Interviewee 1, personal communication, May 27, 2020). This document ensures the incubator management becomes familiar with the applying team and, at the same time, primes the startup members for the incubation process. A personal meeting between the startup team and the incubator manager also takes place sometimes.

The most salient theme in this stage was the pitch moment. Each startup had an individual short presentation in front of a jury put together by the incubator management. This jury consisted of the incubator representatives and an external judge – usually a graduate of the incubation program or an external expert from the relevant field. According to the incubator manager (personal communication, May 27, 2020), 30 to 40 per cent of those who submit a “one pager” are invited to pitch and approximately 70% of those are then admitted into the program.

iii. Steering

The steering phase represents the incubation program itself. There is ambiguity in the existing literature when it comes to the actual steps and methods of incubation. Hackett & Dilts (2004a) called this process the ‘Black Box of Business Incubation’. An important finding that partly explains this ambiguity is the large variety of incubation programs. In this case study, the

incubator provided three different validation programs as well as an accelerator program⁶. The theme ‘Differences between incubation programs’ was mentioned seven times by five interviewees in the collected data (Table 4).

Table 4: Differences between incubation programs

Code	Interviewees	Mentioned overall	Examples of quotes
Differences between incubation programs	5	7	<p>“[Let me] point out a small difference between these incubation programs. The student incubation program is a bit of a skinnier version of the actual incubation program.”</p> <p>“Since last year we also offer a completely online and free program [...] not only for the Utrecht region but for the whole of the Netherlands.”</p> <p>“I did two [programs] at the same time. The other one was also very valuable because that one was more with weekly deadlines [...] And UtrechtInc was way more like ‘you’re doing everything yourself’.”</p>

The subjective approach of the UtrechtInc incubator at the time of this study was to offer a tailored support to each of the incubated teams. As the incubator manager explained, “The way we deal with each startup is not always a linear process. Every time, we design a custom way that we help them in” (personal communication, May 27, 2020). Therefore, it was impossible to mark specific steps along the process. However, the data revealed the main financial and non-financial resources and as well as the value adding activities of the program.

Among the most salient non-financial resources were the coaching and mentoring support. For each program, there is an assigned coach that guides the group of startups through the program, offers help with developing a business plan, asks critical questions and similar business development related activities. The coach was usually an external coaching expert hired by the

⁶ <https://utrechtinc.nl/>

incubator. Furthermore, each startup had the chance to acquire one or more mentors. A mentor was a voluntarily engaged individual with valuable expertise and existing network in a specific field. The incubator facilitates a matchmaking session that helps the mentors and the startups to find a fitting partner. Other frequently mentioned non-financial resources were workshops and trainings, office facility, networking events and monthly meetings with experts from various fields.

In comparison, the financial resources offered by the incubator were not as prominent. The incubator has, however, a large network of investors. Two interviewees also mentioned, that some of the mentors were wealthy individuals who volunteered with the purpose of finding a promising startup to invest in; “There’s a group that is presenting themselves as a mentor, but what they are actually looking for is a startup to invest in” (Interviewee 6, personal communication, June 3, 2020). Moreover, the incubated teams have the possibility to apply for a bank loan that is offered to the incubator graduates.

The most salient value-adding activity was the presence of a helpful peer environment in the incubator. “The other thing that did help, was the startups around us The peer startups just exchanging ideas ... As they say, it takes a village to raise a kid. That's exactly what it was.” (Interviewee 4, personal communication, May 13, 2020). Other value-adding activities included an iterative learning process, helping the startup to narrow focus to a specific target audience, and to launch their product.

At the end of the program, there was another pitch moment, called the Demo day. The graduating teams were encouraged to invite their own audience and presented their results to the incubator management and mentors. Overall, the program length varied from 3 to 10 months based on the kind of incubation program.

iv. Accelerating

The last stage of the process was the accelerating phase, the post-incubation period. In terms of this thesis, the focus was on how long it takes the business unit to reach this phase. As mentioned above, the incubator offers various programs that differ in length. However, data were collected on the resulting stage of the business and on the effects that incubation had ex-post. The empirical evidence shows that there is no unified result for all graduates. For example, only one startup has successfully launched the product or service during incubation and was concentrating on growing its customer base, two startups decided to pivot completely based on the findings from the validation program, and one was preparing for launch. A logical connection can be made to the individual approach by UtrechtInc, which results in varying outcomes for each startup. Interviewees were ambiguous in their descriptions of connections or effects of incubation after the program ended. Many interviewees were struggling due to the COVID-19 outbreak at the time of data collection and were dealing with an exceptional situation. These difficulties are part of the external environment that all startups operate in and cannot be influenced.

The resulting process model of business incubation is visualized in Figure 3. The collected data proved the proposed model to follow the same four stages over time and it further explained the detailed characteristics of the championing and steering stages. The only adjustment to the proposed framework was the addition of a black box feature in the steering stage.

4.2 Corporate Entrepreneurship

The most salient theme in the corporate entrepreneurship process data (and of the entire data collection) was the involvement of various stakeholders in Smart City innovation efforts. Table 5 shows how often the interviewees mentioned the necessity of cooperation across various parties. As Interviewee 12 stated: “We're looking for the quadruple-helix. You have the business,

you have the government, you have the people and you have universities and schools. And the right combination creates the best ideas and innovations” (personal communication, June 8, 2020).

Table 5: Cooperation across many stakeholders in the Smart City sector

Code	Interviewees	Mentioned overall	Examples of quotes
Cooperation across many stakeholders	6	22	<p>“We're looking for the quadruple-helix. You have the business, you have the government, you have the people and you have universities and schools. And the right combination creates the best ideas and innovations.”</p> <p>“Smart City [...], it's an environment in which private companies within the public sector should cooperate.”</p> <p>“They saw that a sustainable, livable, open city requires connecting different sources of data from energy corporations, housing corporations, municipal mobility, energy, all kinds of different topics.”</p>

In keeping with the quadruple-helix model, this finding suggests that Smart City innovation originates via a large variety of sources within the urban network, such as internal corporate venturing, business development efforts, governmental initiatives, student internships and other. Figure 4 presents an overview of all origins of innovation discovered in the collected data. The visualization is divided into external and internal origins. However, it was often the influence of a combination of external and internal factors that initiated innovation which cause the concrete links to remain ambiguous. A few examples from the data showed that a governmental policy aimed at fostering Smart City innovation created an incentive for corporations in the ecosystem to explore new innovative solutions (for example in energy transition or mobility); these companies then changed their long- or short-term strategies that resulted in a variety of bottom-up or top-down initiatives such as new internal ventures or incremental innovations on existing projects; for a more concrete example: “It started in 2015, a subsidized project from a ministry. ... governmental organizations asked [us] to develop more than that specific project and then we

invested as [the organization] in this environment.” (Interviewee 9, personal communication, June 9, 2020).

Figure 4: Origins of Corporate Entrepreneurship in the Smart City sector

Origins of Smart City Innovation		
Second Order Codes	First Order Codes	Examples of Quotes
External	Cooperation With Startups (2/2)	“Actually, it’s all always been the approach of [the corporate organization] to work with startups rather than develop startups themselves.”
	Governmental Initiatives (3/3)	“Our clients are governments and we work on tenders. They publish a tender and we want to be registered for it. That’s how most of the work and in this case also the innovation started.” “It started in 2015 as a subsidized project from a ministry.”
	Internships (2/2)	“[...] very often also students help us, interns or masters students, who think of it in their theses or internships. We try to let them explore a certain topic and that gives a start into something that you can eventually build out into an innovation”
Internal	Innovation Lab (5/5)	“We have a [...], an innovation center, that is focusing on giving support to the company on digitization of our services.”
	Internal Corporate Venturing (3/4)	“The CEO thought about a new department for that [innovation]. It focuses on different kinds of products and services. So it’s kind of an in-corporate incubator.”
	Innovative Company Culture – Business Development (3/3)	“We are a speed boat, a small company a within a large company.” “They developed, actually, in-company startups.” “I started the Smart and Healthy City group within the company”
	Platform for Ideas (2/2)	“Every employee is an innovator as well. So everybody is asked to think about what makes your work better? What do you need? And we have strategy meetings where you can share.” “Within [the corporate organization], we have an environment of stimulating and anticipating innovation [...]. It sounds like a large organization, but it’s a very short way.” “Traditionally speaking, we try to innovate as much as possible on the project itself.”
	Strategic Management Decision – Small Projects (1/3)	“We also have the ‘Ideeen Platform’, so platform for ideas.” “Yeah, it’s a management decision.”

Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Furthermore, the collected data suggests that there is no unified approach to corporate entrepreneurship. To quote one of the interviewees: “Corporates are so different from each other by nature. ... it's very hard to compare one company to the other. One thing that works very well in one company could totally not work in the other one” (Interviewee 14, personal communication, June 12, 2020). Each company chooses the best subjective approach to innovation that aligns with its individual strategic development. The interviewees for this data set were carefully chosen to

explain at least one such process in detail each, although each of them mentioned multiple different ways their organization takes to innovate. Some of the discovered approaches are impossible to track by a process model, such as an innovative company culture: “We have an environment of stimulating and anticipating innovation. And if employees will do that, there are many different ways to bring that specific idea to the board of management” (Interviewee 9, personal communication, June 9, 2020), or incremental innovation: “Traditionally speaking, we would try to innovate as much as possible on the project itself. ... So, that's the incremental innovations that are occurring already in the company” (Interviewee 12, personal communication, June 8, 2020).

Nevertheless, there are process patterns across a number of innovation processes discovered in the data, that follow the steps defined by the proposed framework. Namely, the process of internal corporate venturing and the process of innovation labs were possible to be derived from the data. The resulting process models have the ability to serve as a comparative study, they are however not intended to serve as a comprehensive framework for further research as more data would be need for such a framework.

The following sections briefly zoom in on the discovered processes in internal corporate venturing and innovation labs. The resulting models are synthesized and used as a comparative framework of corporate entrepreneurship. Thereafter, the resulting model is described according to the four steps of the proposed framework.

Internal Corporate Venturing

Overall, there are three counts of internal corporate venturing as a possible origin of corporate entrepreneurship in the collected data. Two of these interviewees also gave a detailed account of such a process, one originating internally through own intrapreneurial behavior, the other externally as a result of a strategic management decision. The origins of these ventures play

an important role especially in the last phase (accelerating) of the venturing process. While a venture that has been developed based on a management decision fits well within the corporate strategy, the intrapreneurial venture struggled with a strategic misfit within the parent organization. To quote the interviewee, “With the smart city group, I was a bit of the odd duck in the company” (Interviewee 10, personal communication, June 9, 2020).

When observed from a wider perspective, the process follows the 4 stage-pattern of the proposed framework: envisioning (where the idea is born via intrapreneurship or strategic managerial decision), product championing (the project leader pitches his or her idea to the management, or alternatively, is chosen to take lead of the new venture), steering (where the new venture receives various resources and is developed into a functioning unit), and accelerating (where the unit becomes an autonomous business line).

Similar to business incubation, the steering phase was not a predefined step-by-step process. Interviewees described various activities such as validation of a business plan, hiring staff or interns, creating prototypes or pivoting based on market feedback. To illustrate the ambiguity of individual steps in the steering process, it has been marked as a black box. The venture managers indicated they had access to a number of resources at hand such as time (allowed by the organization to be spent on the venture creation instead of previous employment activities), own governance, possibility to hire staff or cooperation across departments of the mother organization. The top-down originating venture had 25 employees at hand to begin with (and had evolved to 150), whereas the bottom-up initiative was at first a one-person project that only gradually increased the number of employees and interns involved. The resulting bottom-up and top-down processes are visualized in appendix 7.3.

Innovation Lab

Among the eight interviewees in the sample, five mentioned the existence of an innovation lab in their organization. Two interviewees were the managers of such departments and had provided detailed information on the process. Additional information was obtained from the indirect experiences of other interviewees. A visualization of the resulting process model for innovation labs can be seen in appendix 7.4.

The process commonly begins with an intrapreneurial initiative by an employee. One interviewee also mentioned that the innovation lab also tries to take an active part in ideation: “[We are] also focusing on the ideation part, to inspire people by organizing events every year, also together with clients” (Interviewee 14, personal communication, June 12, 2020). However, this ideation has not yet been successfully linked to the innovation process in the organization. Once an intrapreneurial idea is born, the innovators commonly contact the innovation manager for a first screening of their idea. In one innovation lab, they also get introduced to a mentor, who can help shape the idea toward successful implementation already before the innovation lab starts. Thereafter, a pitch to an innovation committee takes place. The jury decides whether or not the idea continues to the later stage: “He needs to prepare a presentation, a pitch for his idea and also what he needs [in order to] to work out this idea. Most of the time, it's hours - he needs time. Or maybe he needs other team members” (Interviewee 16, personal communication, May 27, 2020). There is a contrast in the last phase of the observed steering processes of innovation labs. In one lab, a very distinct end-presentation took place: “At the end of all these steps, there's again [a presentation] like Dragon's den. Then, also the directors are involved and there is real money. It's about money and real investing” (Interviewee 16, personal communication, May 27, 2020). If the project receives a green card from the jury, they get access to investment and start building a

minimum viable product while being implemented in a corresponding business line. In the other case, there was no end-pitch. The focus was largely on making sure the innovation can be handed over and integrated well within the company, which proves to be a challenge in many cases: “[It is] the most important and the most difficult process of the whole innovation part” (Interviewee 14, personal communication, June 12, 2020).

Furthermore, there was a contrast in the way the innovation labs chose to support innovative teams over time. In one case, there was an annual program that could only be entered at a certain time. A specific number of teams was then collectively guided through the process. In the other case, innovative ideas can be brought up at any given time and follow a tailor-made process individually.

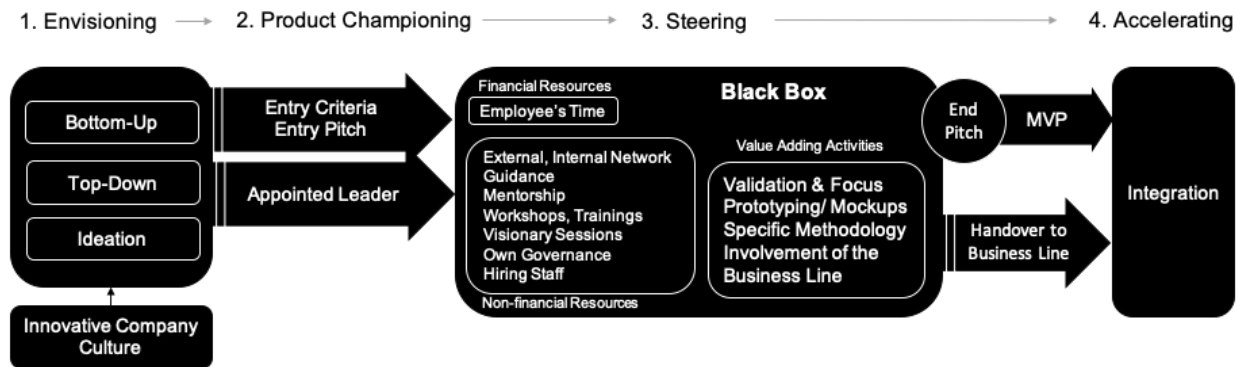
Resulting Process of Corporate Entrepreneurship

This section presents the results of data analysis for the corporate entrepreneurship process (Figure 5). The data is presented in four chronological clusters:

- i. envisioning,
- ii. championing,
- iii. steering, and
- iv. accelerating.

For each section, a description of the most frequent and most relevant codes is provided. For a coding scheme visualization of this process, see appendix 7.5.

Figure 5: Resulting Model of the Corporate Entrepreneurship Process



i. Envisioning

The first step of the framework is the envisioning process. The data shows that within corporations, an innovative idea is born in three various ways: through intrapreneurship or a similar bottom-up initiative by an employee (1), by top-down strategic behavior such as management decisions to create a new venture (2), and in one case, by organizing ideation events and actively participating in new idea creation (although this practice has not yet been directly linked to a successful innovation (3). Furthermore, innovative company culture was mentioned as an indirect effect on the envisioning phase.

ii. Product Championing

Once an innovative idea is born, there are a few various ways in which innovators seek to acquire guidance and resources. In the case of bottom-up initiatives, there are processes and criteria in place for the innovators, such as a screening meeting with an innovation manager or submitting a business plan. These steps are then followed by a pitch to management. The innovator has to present his or her case to a jury consisting of either the innovation department, the corresponding business line, or another entity within the organization that has potential interest on the budget of

the innovation. Commonly, the main focus of such a presentation is to make a business case for the organization and to ask for required resources.

In the case of top-down initiatives (strategic management decision to innovate), the project leader is elected by the management. This leader is then put in charge of development of the innovative project. Commonly, such an initiative takes place in the form of internal corporate venturing or in smaller individual projects that are part of an existing business unit.

iii. Steering

Once the idea is approved or appointed within the organization, the steering phase begins. The data revealed that there is no step-by-step approach to this process. Instead, it consists of an assortment of resources and value adding activities. Hence, this stage was labeled a 'black box'.

Time as a resource was the most salient code in the corporate entrepreneurship interviews. It is in this model considered a monetary resource. After inquiring of an interviewee which resource was more important in the process, time or money, the response was: "Well, we consider this the same thing" (Interviewee 14, personal communication, June 12, 2020). Allowing an employee to spend working hours on an innovation project means that they will not be able to fulfil their regular function as before. These employees are usually invested part-time or less in their innovation project. In one case of an innovation lab, the budget was purposefully shared between the innovation lab and the corresponding business line; "by doing that, you create ownership in the business line as well, and they become responsible for success as well" (Interviewee 14, personal communication, June 12, 2020). Furthermore, the collected data shows that neither of the two organizations provided such an office facility in a separate location.

Other resources found in the data were, inter alia, own governance of the nascent business unit, guidance from the mother organization, access to internal and external expert network, or the

opportunity to hire additional staff. A resource that has never been mentioned directly, but remained implied in the corporate innovation context, was a monetary investment by the parent organization: “And then for one case, we developed this platform, it cost multimillion” (Interviewee 9, personal communication, June 9, 2020).

The most salient value-adding activities of this ‘black box’ were validation activities and corresponding narrowing of focus or pivoting, using specific methodologies (for instance, the business model canvas, brainwave, and lean canvas), and cooperating with other department or external partners.

At the end of this phase, various ‘exit’ moments were found in the data. In the case of internal corporate ventures, the project leader reports the progress on multiple occasions without an end-pitch. The focus was mostly on integrating the innovation to the business, either as a new product to the portfolio, a new tool for internal use, or an internal venture. Only one of the innovation labs had a distinct pitch to management (including the CFO and other high management representatives) at the end of the program.

iv. Accelerating

The last phase, accelerating, represents a point where the innovation is included in the organization and concentrates on growing and/ or scaling. In terms of this paper, the focus was on the length of how long it took to reach this phase. Nevertheless, each case showed different lengths of the previous phases. In some cases, it was a matter of weeks, in other it took a year or even longer. However, data shows that there are already initiatives in place in order to accelerate the bottlenecks of the innovation process, as Interviewee 14 stated: “From now on, we try to have it in six weeks, but I have some teams that are already going on for one and a half years” (personal communication, June 12, 2020).

4.3 Secondary Results

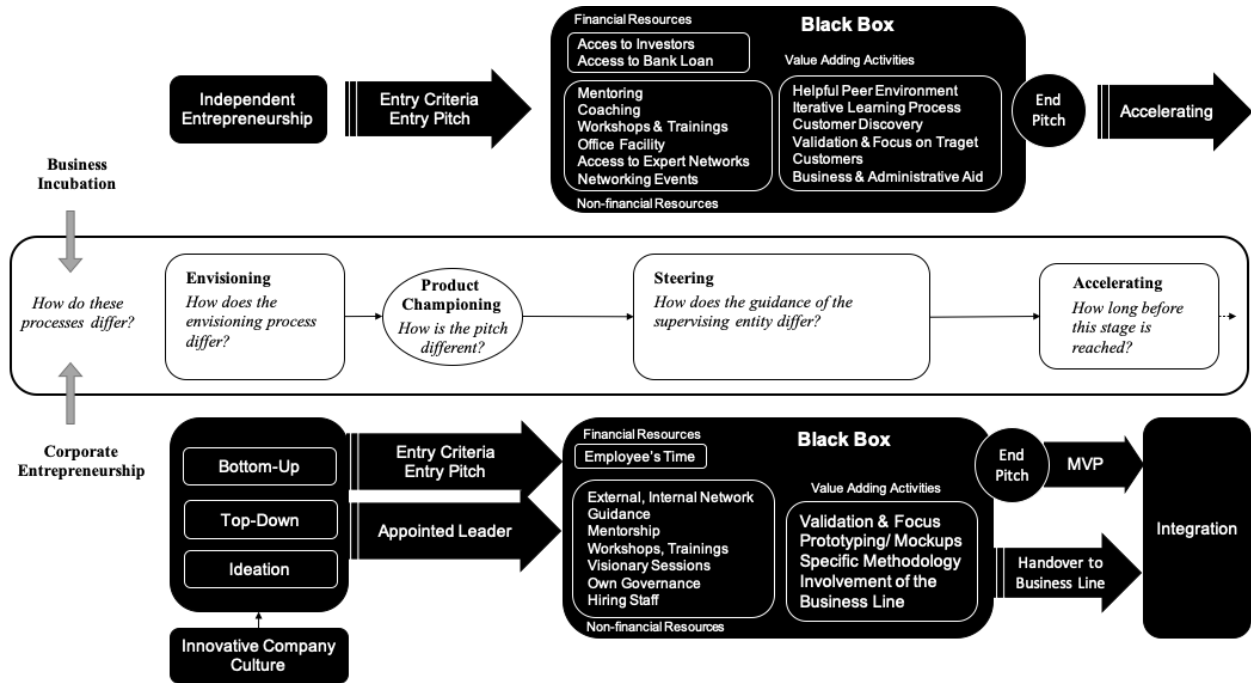
A salient theme in the observed data was the frequent misfit of bottom-up innovations with the parent organization's strategy. Especially in cases where the innovation is a tool intended to be used internally or offered to a client instead of an existing tool that does not exhibit major flaws, interviewees reported experiencing difficulties integrating innovation in the existing business: "That's a completely different business model than what we are used to" (Interviewee 10, personal communication, June 9, 2020), or: "There should be a handover to the business, and we try to standardize that, but it's so hard. ... And that's the hardest part because people need to change their way of working and not everyone likes change." (Interviewee 14, personal communication, June 12, 2020). Similarly, some innovations do not fit the overall strategy or brand of the parent company and are therefore difficult to implement. For example, in the case where an innovative product is developed within a consulting firm, a respondent stated: "Sometimes, the brand of an engineering firm is not correct" (Interviewee 10, personal communication, June 9, 2020).

Furthermore, interviewees often mentioned high levels of uncertainty regarding the added value and future business potential of innovation in the Smart City sector. An overview of all secondary results-related codes can be viewed in appendix 7.5, Figure 15.

4.4 Comparative Study of the Resulting Processes

In this section, the observed processes of business incubation and corporate entrepreneurship are analyzed in a comparative framework (Figure 6). Overall, the resulting process models carry many similarities. Both follow the four stages of the proposed framework with minor differences in the individual approaches in each stage. In order to come to an answer to this thesis' main research question, the differences and similarities are explained for each phase individually below.

Figure 6: Visualization of the Comparative Framework



Envisioning

In the envisioning phase, the main difference between the two processes lies in the (non)independence of the process to the subsequent phases. In other words, ideation and innovative ideas are commonly born well before the startups approaches a business incubator, whereas in corporate settings, ideation is often part of the overall process (directly or indirectly). Some corporations take active steps towards fostering innovation (for instance by innovative corporate culture or organization of ideation events). In this case study, the incubator had little to no influence on the genesis of innovation.

Product Championing

The pitch to management, whether corporate or incubator, is commonly very similar. The innovator must present his or her idea to a jury which decides whether or not the idea will be

allowed into the next stage. In all cases, a number of entry screening criteria must be met. For instance, the innovator(s) must submit a one pager, a business plan, or have a face-to-face meeting with the corresponding manager.

Steering

There is a number of similarities and difference in the steering phase of both processes. Both processes have the characteristic of a ‘black box’, meaning that there is no step-by-step process defined. On the contrary, the responsible guiding entities strive to provide a tailor-made support to the nascent businesses based on their specific needs. In both cases, these entities do so by offering a variety of financial and non-financial resources and value-adding activities. That is where the differences between the two processes lie.

When analyzing the results, it is important to keep in mind that there are inherent differences between corporate entrepreneurship and business incubation. Not all differences mean that there is something lacking in the other process. For example, a parent corporation usually has monetary assets available if an investment is needed. However, the corporation must make an investment in the ‘free’ time it allows the employee to explore innovative ideas instead of their regular assignments. In contrast, an incubator usually does not have monetary assets available (although it can compensate by offering a network of external investors) and there is no time-related investment necessary. Furthermore, resources such as own governance, possibility to hire staff or cooperation across departments of the organization are a defining feature that differentiates corporate entrepreneurship from business incubation. In part, an incubator already substitutes these by maintaining a large external network and organizing various networking events.

Non-monetary resources, that the business incubator made abundant use of, were mentors and coaches who help the participants in the incubation process. In contrast, both of these themes

were barely mentioned in corporate entrepreneurship. A mentor is a person with relevant experience, broad network and case-specific knowledge to aid the nascent business unit. A coach is an external expert who guides the project or startup founders through their business development, organizes workshops, helps in creating a business plan and asks critical questions (Interviewee 1, personal communication, May 27, 2020). In corporate entrepreneurship, the managers of innovation labs or similar departments usually took over the role of a coach. Only in one case has an innovation lab appointed a member of high management staff to become a mentor.

Both processes made use of a variety of modern methodologies, such as the business model canvas or design thinking to accelerate venture development. These served to validate the business model, focus on target customers, or make a pivot in case of invalidated idea. Furthermore, the incubation process had a strong benefit of providing a helpful peer environment which was a feature never mentioned in the corporate settings. On the contrary, some interviewees even mentioned a lack thereof.

A controversial theme with regards to this study is the resource ‘office facility’. The incubator offered a co-working space as well as private office spaces, which helped enhancing the above-mentioned helpful peer environment. However, many interviewees mentioned they did not use the office facility. Nonetheless, they still had to attend all meetings, workshops, feedback sessions and other activities in the incubator building together with other peer teams. In the observed data, none of the corporate innovation labs offered a separate facility where innovative ideas could be worked on (although public sources show that there are other companies that do, see page 34). The innovation lab allows employees to work from their regular offices and organizes meetings in the regular meeting rooms or coffee areas, which may have an effect on the low levels of helpful peer environment and on the innovative culture of the company in general. Two

interviewees also frequently mentioned the rigidity of the organization being a bottleneck of in-house innovation.

Accelerating

The length of both processes is not fixed and differs in each case. The business incubator offers a number of programs that vary in length from 3 to 10 months. Similarly, the observed corporate entrepreneurship process varied in length for all origins of innovation. Furthermore, the exact beginning of the accelerating phase is often ambiguous for internal corporate ventures because the innovator does not follow a program or get help from an innovation manager. For this reason, the length of the corporate entrepreneurship process cannot be specified.

The difference in this stage is found mainly in the inherent nature of corporate innovation and the strategic misfit with the mother organization that is often present in internal corporate innovation. This was an especially pressing issue for bottom-up corporate initiatives, such as internal corporate venturing or projects in an innovation lab.

5 Discussion and Conclusion

The objective of this paper was to find and compare differences and similarities between innovating in a corporate organization and startup incubation in the Smart City sector. The study draws on existing literature about process models for corporate entrepreneurship and business incubation and provides a comparative framework that may serve as a unified model of guided entrepreneurship.

The two observed processes share many similarities, although they are inherently different in their nature. The resulting framework confirms that participants of both processes go through four distinct phases: envisioning (1), product championing (2), steering (3), and accelerating (4).

In the envisioning phase, the incubator notably did not participate on the ideation or establishment of innovation, which contrasts the steps taken in corporations. However, as Hackett & Dilts (2004b) mention, business incubators usually do not have the capacity to build new startups from scratch and thus cannot be expected to take an active part in ideation.

An adjustment to the proposed framework is the ‘black box’ characteristic of the steering phase that was previously presented in a business incubation process study by (Hackett & Dilts, 2004a). In other words, the guidance of the steering entity does not follow a predefined step-by-step process, but rather provides a variety of resources and value adding activities tailored to the participants’ needs. The findings also show that there are differences between the resources and activities used in different incubation programs. These differences become even more profound when compared across multiple incubators (Hausberg & Korreck, 2020).

Nevertheless, a number of resources and activities that were used abundantly by the incubator, were not present in the corporate innovation processes. These include separate office facility, helpful peer environment, and providing coaching and mentoring services.

When it comes to innovation labs, one of the resources that is mentioned as an important one in the extant literature (Fehder & Hochberg, 2014), is providing an office facility in a separate location from the parent organization. The collected data shows that neither of the corporate organizations provided such a facility. An explanation provided by one of the interviewees was: “We have eight offices in the Netherlands. ... In every coffee room, we have large whiteboards with suitcases with all sorts of materials that could help you. So, we don't have a specific office or a specific location, but we try to integrate as much as possible in the business” (Interviewee 14, personal communication, June 12, 2020). However, there are innovation labs within other Dutch

organizations (such as Sparklab, an initiative of the NN Group⁷), that intentionally keep a separate office facility to enhance the innovative behavior of employees without an influence of the mother company. According to Magadley & Birdi (2009) and Moultrie et al. (2007), a separate office facility allows the participants to escape their regular workplace along with its inherent stressor while also promoting a creative and innovative atmosphere. Moreover, such a facility supports cooperation and networking among the participants, creating an innovative and helpful atmosphere.

Mentoring and coaching have been often mentioned as the number one contributions of the incubation program. As such, both these resources have the potential of serving the same role in the corporate settings where they are largely absent.

Furthermore, varying degrees of structural rigidity and the complex organizational processes were mentioned as barriers to corporate entrepreneurship. An observed theme that could be seen as a potential result of some of the above findings was the frequent difficulty of integrating innovative solutions in the parent organization. Especially in the case of bottom-up corporate entrepreneurship, participants often experienced strategic misfit with the mother corporation. This finding may be pivotal to related issues of unsuccessful or slow corporate innovation, and thus opens an opportunity for further research. Extant literature has paid little attention to this topic, either by pointing out the strengths of the link between company strategy and autonomous vs. induced strategic behavior (Burgelman, 1983b), or by exploring the strategic fit between the corporation and external parties such as startups (Kreiser, Kuratko, Covin, Duane, & Hornsby, 2019; Shankar & Shepherd, 2018).

⁷ <https://www.nn.nl/Over-NationaleNederlanden/Sparklab.htm>

Furthermore, the results confirm that the extant corporate entrepreneurship literature does not fully represent the status quo. Namely, this study provides a provisional process model of innovation labs, which has not been included in the corporate entrepreneurship (Sharma & Chrisman, 1999) or innovation lab literature (Fecher et al., 2018). However, the model merely has the ability to serve as a segment of the comparative framework of this paper and is not intended to serve as a comprehensive framework for further research as more data would be needed to develop such a framework. Innovation labs are an example of numerous modern approaches that corporations use to remain innovative and to accelerate the related processes. In line with extant literature (for example Edison et al., 2018; Ovesen, 2012; Smith, 2007), they use tools such as business model canvas, design thinking, or The Lean Startup methodology.

In the Smart City context, this paper provides an empirical verification of the modified triple-helix model by Lombardi et al. (2012). Involvement of a variety of interdisciplinary stakeholders in Smart City innovation was by far the most salient results among all collected data. Furthermore, innovation in Smart City often involved high levels of uncertainty about the added value of the inventions, implying a necessity for further research that would provide both theoretical and practical implications in this area. Additionally, the results point out high levels of uncertainty about the added value of Smart City innovation. This could be due to the complexity of the quadruple helix model in Smart City, combined with the novelty of the sector in general - resulting in unexplored characteristics of the often radical innovative solutions (Lombardi et al., 2012; Yigitcanlar et al., 2018). As a result, this may create additional barriers (especially for SMEs) to provide innovative solutions in this sector.

5.1 Limitations

As with any study, this paper has certain limitations that point to potential new directions for research. Firstly, these results are limited to the participants of the study. This study was majorly based on the participants' general perception of the processes. Therefore, it may have overlooked certain themes that may be accounted to the participants' attributes, such as demographics, values, attitudes or tenure.

Furthermore, a longitudinal study would have been a more fitting empirical strategy to understand the dynamics of both processes and to obtain more objective, real-time data. Additionally, while interviewees for business incubation consisted majorly of the participants, the sample for corporate entrepreneurship varied across participants and their managers which may have influenced the explanatory power and comparability of the collected data. Further research involving a larger sample of the corporate entrepreneurship participants and innovators would help to assure completeness of the results.

The industry-specific context allowed for specific contributions; however, it may also be beneficial to explore other sectors and industries than Smart City. Individual attitudes may vary across industries. Furthermore, the dynamics of Smart city (namely the quadruple helix component) also influence the specific origins of innovation that may vary in a different field. Further research may examine whether or not this study is replicable across different contexts. Similarly, involving different incubator or multiple such organizations would review whether the results generalize across varying organizations.

Although there is undoubtedly a dire need for research in the Smart City innovation area, the generalizability of the research results is problematic due to lack of academic consensus on the

definition of the concept and categorization of the related organizations. As a result, the startups in the sample of this study are arguably less Smart City-related than the corporations.

5.2 Recommendations to Practitioners

In terms of managerial contributions, the ‘lessons learned’ remain largely case specific. To quote one of the interviewees (Interviewee 14, personal communication, June 12, 2020): “The nature of the company defines what the success factors of an innovation program are. It's very hard to compare one company to the other. One thing that works very well in one company could totally not work in the other one.”

Nonetheless, some of the findings provide valuable insights for practitioners of both sides. In comparison to business incubators, corporations of this study fail to provide a helpful peer environment. At the incubator, such an environment was created by centering all activities into one location that also provided an office space to the incubatees. In line with Magadley & Birdi (2009), a separate office space has the potential of providing an environment that enhances organizational creativity and provides a space that is safe from regular workplace distractions. Moreover, the findings show that a central location allows participants to easily connect with each other, gain motivation and a variety of supplementary resources for their business. Corporations should consider providing a dedicated physical location, an ‘innovation hub’, or a separate office space that would allow fostering an innovative and helpful peer environment.

Furthermore, the incubator in particular successfully employs expert coaches who steer the participants throughout their business development. Each startup also has an opportunity to meet a mentor (an external volunteer with industry knowledge, experience and network). In one case, a corporate innovation lab assigned a management representative who fulfilled the same role in the corporate settings and assigned the managers of the lab to represent a coach. It is recommended

that companies provide coaching and mentoring support to the participants, as these resources proved to be the most value adding resources in this study. Especially for bottom-up initiatives, such as internal corporate venturing, innovators commonly receive less steering support, leading to an unstructured or prolonged innovation development process.

Additionally, large companies ought to be aware of the potential dangers of bottom-up initiatives failing to integrate within the company due to a misfit between the corporate strategy and the novel solution. This proved to be a very common problem in corporate entrepreneurship. It is recommended that companies address this issue in the early development stages of the innovation to ensure successful integration, for example by running a pilot study in the business environment where it will be implemented or by adjusting existing processes beforehand. Involving a corresponding business line in the developing project's budget may help to enhance the sense of ownership and responsibility for the project's success even after it graduates from the guided program.

Finally, governments and other stakeholders who aim to foster Smart City innovation should pay attention to exploring and defining the added value of such initiatives. Innovators in this sector operate under high levels of uncertainty, being unable to plan or predict their return on investment, which in turn creates additional barriers to entry.

6 Literature

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7 Appendixes and supplementary materials

7.1 Interview Guide

This interview guide was developed based on the proposed framework, using the guidelines by (Harward University, 2017; Magnusson & Marecek, 2015). The interview guide was designed in such a way, so that it remains flexible and open to new inputs throughout the data collection efforts (Gioia et al., 2013). In order to account for differences in in the two processes based on the proposed framework, two separate interview guides were created.

Business Incubation

0. Intro

- Introduction of the researcher
- Explanation of the thesis topic
- Assurance of confidentiality
- Permission to record the interview for the purpose of transcription?

- Can you briefly introduce yourself and your startup? → Value proposition
- How big is the company - how many employees/ founders/ volunteers?
- When did you participate in the business incubation program? (How long ago?)
- Which program was it exactly?

1. Envisioning

- When did you come up with the business idea? (Goal: to find out whether the ideation happened well before incubation or whether it was part of it)

Potential Follow-up Questions:

- Did the incubator play a role in the envisioning/ ideation process?
- How did you come up with the business idea? (E.g. user entrepreneurship? Design thinking? Lean startup methodology?)

2. Product Championing

- At what point did you decide to go to the incubator?
- What were the criteria to enter?
- Did you have to pitch your idea to the incubator?
 - Who attended the pitch?

Potential Follow-up Questions:

- How did you find out about the incubation program?

- How did you prepare for the pitch? (Goal: to find out whether the incubator had explicit criteria/ expectations, whether the incubator gave any guidelines)
- What did the pitch contain?

3. Steering

- How did the program start?
- How did you proceed during the process?
- How did the incubation program end?

Potential Follow-up Questions:

- Did you start selling your product/ service during the business incubation?
- Were there any explicit steps in the process?
- What were the main services, activities and resources of the incubation process?
- What were the additional/ supporting services, activities and resources of the incubation process? – Indirect?
- Did you get any financial support at that time? If so, how?

4. Accelerating

- How long was the incubation process?
- How did you proceed after the incubation process?

Potential Follow-up Questions:

- Did the incubation play a role in your activities after incubation (even indirectly)?
- Did you attract financing after the incubation? / Did your startup grow organically (self-financing) after the incubation?

End of the interview

- Any comments, remarks, feedback from the interviewee?
- Can be contacted for clarifications/additional information?
- Who else would you suggest I could speak to?

Corporate Entrepreneurship

0. Intro

- Introduction of the researcher
- Explanation of the thesis topic
- Assurance of confidentiality
- Permission to record the interview for the purpose of transcription?
- Can you briefly introduce yourself, the company and the innovation project? → Value proposition

Optional:

- To what degree is the project autonomous within the corporation? (Goal: to find out if it is fully internal corporate venturing)
- How big is the parent company? (nr. of employees)
- How big is the project? / How many people are part of the project?

1. Envisioning

- How was the idea born? (Expected answers: e.g. Intrapreneurship, Active corporate innovation – methodology: i.e. design thinking or lean startup)

Potential follow-up questions

- Who came up with the idea?
- When was the idea born?

2. Product Championing

- From the management/ organization perspective, how did the project develop in the beginning within the company?
- When/ How was the idea brought to the management? Who brought it up?

Potential follow-up questions

- Were there any other criteria or requirements to continue with the project?

3. Steering

- How did the project evolve (after management approval)? / What were the first steps?
- Who was responsible for the project? (Goal: Was it the one who came up with the idea?)
- What were the main resources provided?

Potential follow-up questions

- Was there any specific process of developing the new business idea?
- How did the management support the project?
- What were the main services, activities and resources the project received from the corporation?
- Did you start with sales already?

4. Accelerating

- How did you move from the validation & development stage to scaling & accelerating it?

Potential follow-up questions

- When did this happen?
- Does the project currently finance itself? (Goal: to find out if they receive funding from the parent company)

End of the interview

- Any comments, remarks, feedback from the interviewee?
- Can be contacted for clarifications/additional information?
- Who else would you suggest we could speak to?

7.2 Coding Scheme of the Four Stages in Business Incubation Process

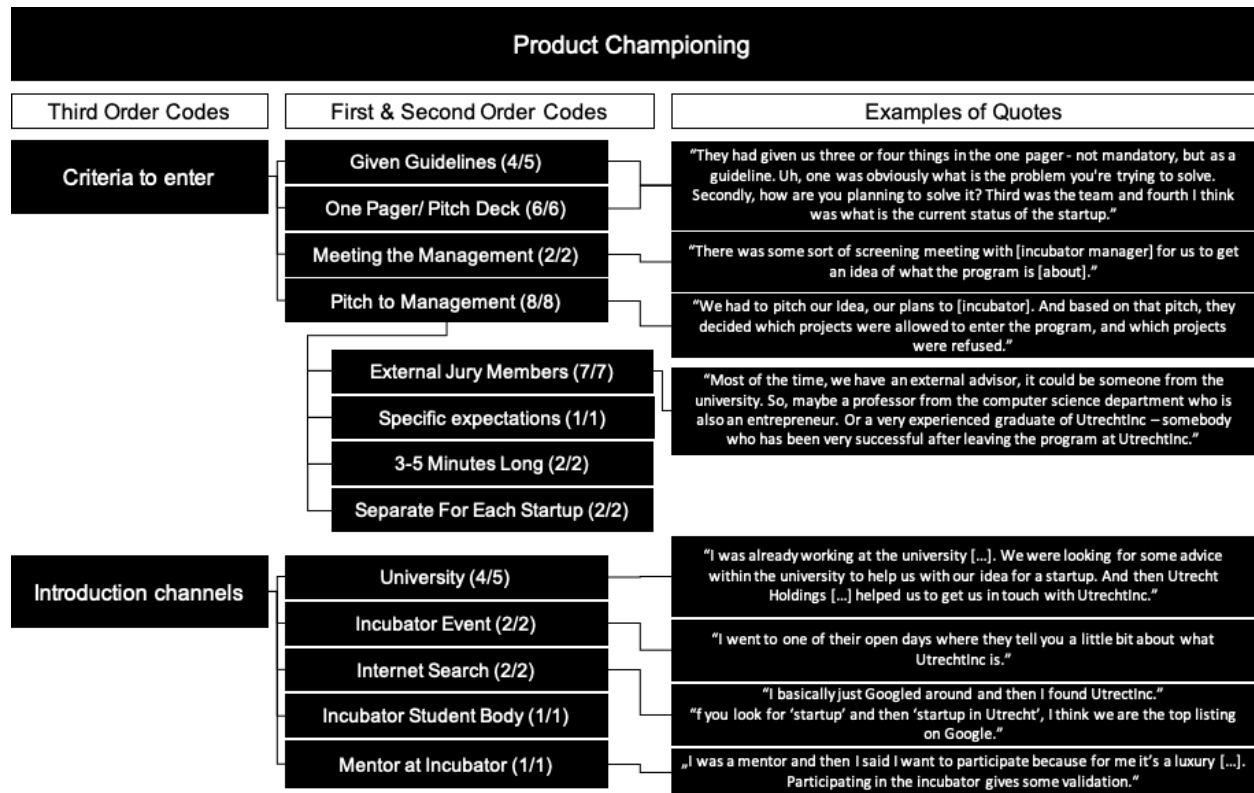
The frequency of a theme is signaled behind each corresponding code by the number of interviewees mentioning the theme and the overall count of how often the theme was mentioned in all interviews, for example ‘Coaches (7/10)’ means that seven interviewees mentioned having a coach at least once and it was mentioned ten times overall. This allows to recognize the most salient codes.

Figure 7: The Envisioning Phase of the Business Incubation Process

Envisioning		
Second Order Codes	First Order Codes	Examples of Quotes
Ideation	User Innovation (2/2)	"We were shipping a small package from San Francisco. [...] And me and my wife started thinking about this [...]. So we did a quick prototype, that was in 2018, and then we applied it to our own small business that we had at that time."
	Side Project within the Field of Employment (2/2)	"I did this with Peter, who is actually an old house mate of mine from when I was a student. He has a company that does a lot of projects on financing solar generator fields, just solar panels on business rooftops. [...] And he knew I had a background in it and you know, business studies. He said, 'Would you be able, as an independent guy, to look at this project?' And that's what we've done."
	Academic Research Project (2/2)	"I conduct research. [...] And well, besides that as a spinoff of one of my projects, together with a colleague, I've joined last year the science-based startup program of UtrechtInc."
	Startup Formed Independently of Incubation (6/7)	
Progress Before Incubation	Existing Prototype/ Pilot Study/ First Version of Product (3/3)	"Before the incubator started, which was from September to December, literally in June, July, I think, we had the first working version of the software up and running."
	No Sales or Prototypes/ Pilot (3/4)	"That's the thing with hardware, it needs way more money and development before you can actually have it on the market."
About the Founder	Relevant Background (7/7)	"Having a software background helped."
	Lack of experience (2/2)	"We are not entrepreneurs. And they help us with that you can get legal advice, financial advice."

Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 8: The Product Championing Phase of the Business Incubation Process



Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 9: The Steering Phase of the Business Incubation Process

Steering		
Third Order Codes	First & Second Order Codes	Examples of Quotes
Financial Resources & Activities	Access to Investors (5/8)	"Via UtrechtInc, you can get in touch with these investors. And a lot of mentors are investors too." "We have a great network of investors, people we've known for years."
	Access to Bank Loan for Incubated Startups (4/4)	"We did the Rabobank pre-seed fund. It's a bank loan."
	University as Investor (2/2)	"We have more than 150 mentors." "So, I think the biggest role that UtrechtInc played was through their mentorship program."
Nonfinancial Resources & Activities	Mentors (7/10)	"They have a network of mentors with whom they can put you in contact throughout your development stages so that they can constantly feedback you and help you along the way."
	Pitch – Matching Session (5/6)	"There was also a pitch session. And then we had to pitch our company very shortly and I think there were 30 or 40 mentors present. And then, there were drinks afterwards. So you could get in touch with the mentor that you really want."
	Reporting to Mentor (2/2)	
	Asking Critical Questions (2/2)	
	Coaches (7/10)	"There was a coach as part of the program, it was one person overseeing the class, basically. So all seven or nine startups." "And during that coaching session they talk to an independent coach – so it's somebody who we actually pay, who is specialized in coaching startup teams. And they usually concentrate on the progress."
	Trainings, Workshops, Masterclasses (7/8)	"They have the [business model] canvas model and then all the elements in this model are elaborated on in workshops by various experts."
	Office Facility (5/6)	"Every month, you can meet experts on financial or legal topics or whatever." "Once a month, they bring in people from different areas that have to do with running a business, such as lawyers, developers [...]. And you can book a meeting with them."
Value Creating Activities & Results	Monthly meetings with Experts (5/5)	
	Events, Drinks, Parties (5/6)	"During the program, they participate in all kinds of events – informal drinks, parties, but also matchmaking events – how to find interns, how to find investors, how to find customers, how to find co-founders."
	Access to Network (3/3)	
	End pitch, Graduation Day (5/5)	"We had a big session somewhere around mid-December and we had to pitch in front of a mentor or advisor who came in. We had our own advisors attend as well."
	Helpful Peer environment (4/7)	"The other thing that did help, was the startups around us, [...] because we sit in the same facility, that's our office as well. The peer startups just exchanging ideas [...]. As they say, it takes a village to raise a kid. That's exactly what it was."
	Targeting Customers, Narrow Focus (3/5)	"And also it helped us focusing on one thing. So, initially we wanted to launch several SaaS products and do a consultancy and stuff, trainings. Way too much. They helped you with the focus, especially the coach."
	Launch (3/4)	"In fact, we were spread out on doing anything for everybody as a startup. And that's the worst thing you can do to yourself. We went from that to getting a niche segment of the market that we could address, that had a pain. And the matching of your pain to a market is what you need."
	Pivotal, iterative process (3/3)	"Just talking to customers basically, I think, it's the key activity [...], get out of the building, talk to people."
	Customer Discovery (2/6)	"Actually, I got to pitch quite a lot of times throughout the experience."
	Practise & Learn to Pitch (2/2)	"The program is helping us to keep on track and to keep aiming for goals within a certain time."
Product Development (2/2)	"[...] our company, because it's also a research project, it's really helping us more with the financial, legal and marketing aspects."	
Guidance (2/2)		
Business & Administrative Aid (1/2)		

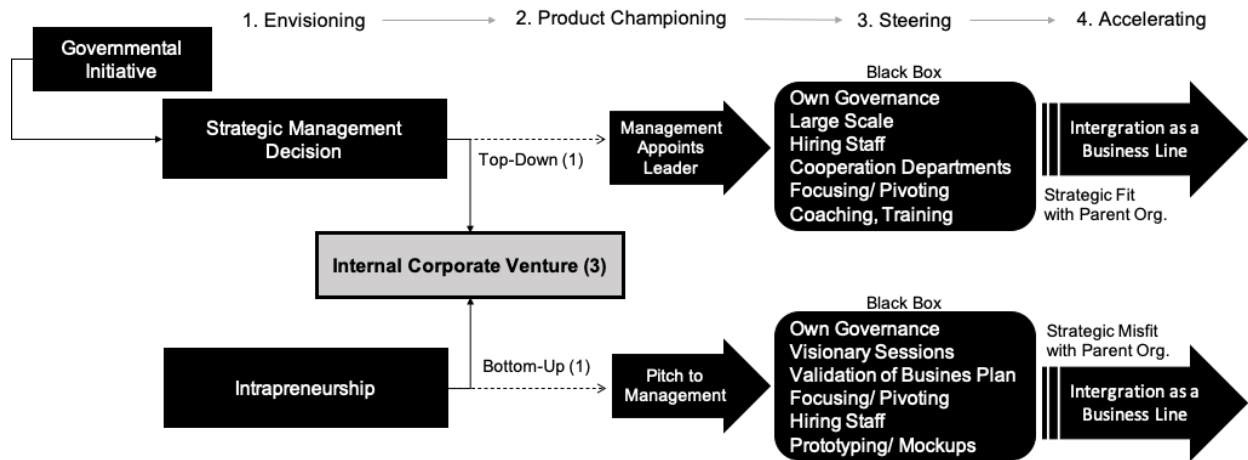
Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 10: The Accelerating Phase of the Business Incubation Process

Accelerating		
Second Order Codes	First Order Codes	Examples of Quotes
Stage of Business (Result)	Not on the Market Yet (3/4)	"At the moment we are starting up our business. We are still negotiating with Utrecht Holdings and with Utrecht university about the intellectual property."
	'Pivot' Based on Incubation (2/4)	"We actually pivoted. So we threw all the stuff away and we started with a new product."
	Preparing for Launch (1/2)	"We just take our time and slowly enter the market."
	Technology Push, No Market Pull (1/1)	"One of the conclusions is that it's slightly ahead of what's now needed. So, I'm in a technology push area versus the market pull."
	Financial Independence (1/1)	"We have another 12 to 14 months of runway."
	Searching Investors (1/1)	"After the incubation, we were already in operations, but we were still small and starting up our operations. And from December to February, our main goal was to address as many customers as we can by essentially signing up as well as doing physical transport for them. So we gained a lot of momentum until mid-February."
	Focus on Growing Customer Numbers (1/1)	
Ex post Incubation Effects	Continuous Contact with Mentors (1/3)	"I'm still in touch with them. They are now my formal advisors for the startup. [...] And that has continued, fortunately, still free advice. We go for lunches, it's a very good exchange."
	Lacking Incubator Guidance (1/1)	"You go from a lot of guidance to no guidance. [...] And eventually, you have to do it by yourself."

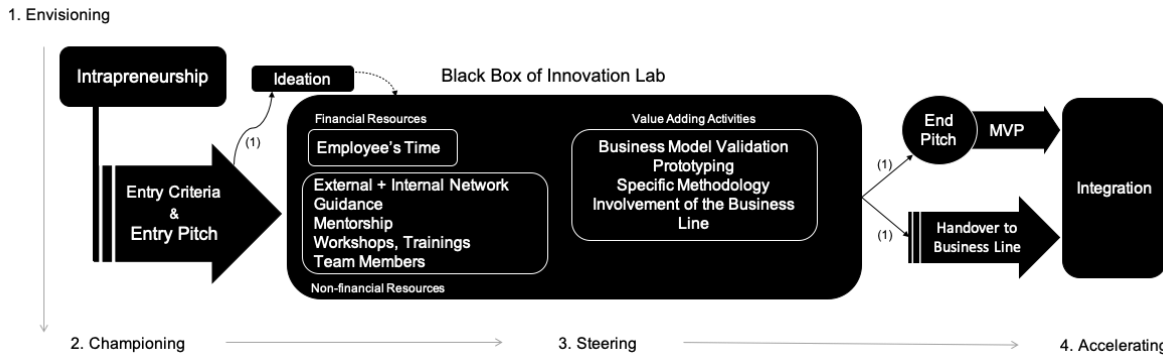
Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

7.3 Visualization of the Observed Internal Corporate Venturing Process



Note: The number of interviewees who mentioned a theme is illustrated next to the corresponding code by the number in brackets

7.4 Visualization of the Innovation Lab Process Gathered in the Data



Note: The number of interviewees who mentioned a theme is illustrated next to the corresponding code by the number in brackets (the total nr. of interviewees describing this process: 2)

7.5 Coding Scheme of the four stages in Corporate Entrepreneurship

Figure 11: The Envisioning Phase of Corporate Entrepreneurship

Envisioning		
Second Order Codes	First Order Codes	Examples of Quotes
Direct	Bottom-up initiatives (6/11)	"So if I have a great idea, I go to the lab, ask for time and some money and they help me starting up, working out my brilliant idea." "I got the opportunity to present my own business plan for a new advisory group that I wanted to start."
	Top-down initiatives (4/6)	"It was the board of management, a strategic decision to invest in this opportunity." "Our clients are governments and we work on tenders, so they publish a tender and we want to be registered for it. That's how most of the work and in this case also the innovation started."
	Ideation Events (1/2)	"But it's also focusing on the ideation part, so: inspire people or organizing events every year, also together with clients."
Indirect	Innovative Company Culture (3/3)	"And then out in the business, we also have room for innovation. So every employee is an innovator as well." "We have an environment of stimulating and anticipating innovation."

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Figure 12: The Product Championing Phase of Corporate Entrepreneurship

Product Championing		
Second Order Codes	First Order Codes	Examples of Quotes
Bottom-up	Pitch to Management (3/4)	<p>"So he needs to prepare a presentation, a pitch for his idea and also what he needs to work out this idea."</p> <p>"Then we go forward to a pitch moment where they can pitch their idea to a specific committee."</p> <p>"I got the opportunity to present my own business plan [...] I presented it to the sector head of that business line, that was my entry point."</p>
	Screening Criteria (1/2)	<p>"So first it was just, you could give me a phone call or send me an email and your idea was in pipeline [...] I typically have many questions and some are very unclear or they don't know yet. So I'm trying to give him some steering."</p>
Top-Down	Appointed Project Leader (1/2)	<p>"So first it was just, you could give me a phone call or send me an email and your idea was in pipeline [...] I typically have many questions and some are very unclear or they don't know yet. So I'm trying to give him some steering."</p>

Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 13: The Steering Phase of the Corporate Entrepreneurship Process

Steering		
Third Order Codes	First & Second Order Codes	Examples of Quotes
Financial Resources	Time (5/10)	"They do have a budget and this budget is typically spent on hours, their own hours. So, to just book time, instead of their own project." "Most of the time it's hours - he needs time."
	Monetary Investment (2/2)	"We're an engineering engineering firm. Selling our hours is the bread and butter, but for me, that didn't count. So that was great."
	Business Line Involved in Budget (1/1)	"So I have a great idea go to the lab, ask for time and some money and they help me starting up."
Non-financial Resources	Internal & External Network (3/5)	"We also work with partners [...] Typically, we're not very good on the CX [customer experience] side [...] So, for example, we work with partners that know a lot about customer experience and user interfaces and things like that."
	Support of Innovation department/ lab (3/3)	"We'll have a face-to-face meeting with them to see where they need any help. Can we help them with other people from the organization or externally?"
	Workshops, Teaching (2/3)	"And after every step [...] we have a check with them, we are also the reviewers, so we have to review it before it goes to the next stage."
	Additional Staff (2/2)	"We had a lot of teaching, a lot of our work is being coached and we team up a lot with the higher management about building but also about making the decision."
	Own Governance (2/2)	"I was able to hire two staff members at the time. And also I had several interns coming."
	Mentorship (1/1)	"It is a small department next to the usual business of [the mother organization] which has its own governance."
Value Adding Activities	Using a modern methodology (4/6)	"They get a coach [...] And this coach is not per se someone that's good in innovation, but it's more of an ambassador from the business line."
	Validation (3/5)	"They need to work on our business model canvas. We're moving towards a lean canvas actually right now." "The instrument they use a lot today is design thinking."
	Prototypes, Mockups, MVP (3/4)	"So first year, I was basically trying to set out a vision and [...] validating my business plan within the organization."
	Narrowing Focus/ Pivoting (2/8)	"I had a whole pool of interns to help and doing a lot of research. And we started developing prototypes - or mockups."
	End-Pitch (1/1)	"When we started with the smart city as a theme, we started in a broad way. And along the way, we focused more and more."
	Hand-over to business (1/1)	"And then at the end of all these steps, there's again like a Dragon's den." "Well, there should be a handover to the business and we try to standardize that, but it's so hard."

Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 14: The Accelerating Phase of the Corporate Entrepreneurship Process

Accelerating	
First Order Codes	Examples of Quotes
MVP after end-pitch (1/1)	"MVP is always after the pitch, after the Dragons den."
<i>Innovation Lab:</i> Hand-over, intergation within parent organization (2/4)	"We create some sort of parallel project to make sure that if an idea in the end is handed over to the business line, that the processes in the business line actually support the idea."
<i>ICV:</i> Growth, Meeting goals, integration within parent organization (2/4)	"In 2018, we did it [planned] for five years with an organization of maximum 200 persons with 10 teams [...] And at this moment we are on the right track. And besides the different management changes within the organization, we are on track on the purpose we had in 2018." "I've been able to follow the dots pretty well to so far. I stated that in my second year I would hire two people and I did, I would supplement it with students which I did [...]."

Note: The frequency of each theme is displayed behind the corresponding code in the following manner: (number of interviewees who mentioned the theme / number of times the theme was mentioned overall)

Figure 15: Secondary Results of Corporate Entrepreneurship Data Analysis

Secondary Results		
Second Order Codes	First Order Codes	Examples of Quotes
Smart City	Cooperation across many stakeholders (6/22)	"We're looking for the quadruple-helix. You have the business, you have the government, you have the people and you have universities and schools. And the right combination creates the best ideas and innovations." "Smart City [...], it's an environment in which private companies within the public sector should cooperate."
	Unknown future & added value of innovations (2/6)	"They saw that a sustainable, livable, open city requires connecting different sources of data from energy corporations, housing corporations, municipal mobility, energy, all kinds of different topics." "And it's different than a normal project. So, we share the risks, we don't know the outcome, but we share the outcome." "Within Smart City, we don't know the price. We don't know who is asking for it. We don't know against which terms. So that makes it very difficult."
Other	Strategic misfit (bottom-up) (2/7)	"That's a completely different business model than what we are used to." "Sometimes, the brand of an engineering firm is not correct." "There should be a handover to the business, and we try to standardize that, but it's so hard. [...] And that's the hardest part because people need to change their way of working and not everyone likes change."
	Rigid corporate system (2/7)	"They are very much still used to doing this waterfall planning, we were already trying to make them a bit more agile... It's challenging." "[...] it can still be challenging because a big company might go slower than you want probably."

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