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**How Do Firms Organize
for Exploration?
Essays on New
Business Models and
Collaboration Across
Domains**

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ABSTRACT

The three papers in the dissertation elaborate on two emerging yet increasingly important ways through which firms organize for exploration: novel business models and open innovation across knowledge domains. The first paper is a review of the literature at the intersection of entrepreneurship and business model innovation that combines a bibliographic coupling analysis of 4149 unique references with a meta-synthesis of the 102 papers citing them. Based on these analyses, the study offers a thematic map of the research questions on which this body of work has focused, and proposes an integrative framework for future research. The review offers an interdisciplinary research agenda that scholars interested in conducting research at the intersection of entrepreneurship and BMI might use as a starting point for future investigations. In the second paper, we explore how accelerators – traditionally conceived as organizational sponsors for start-ups – are changing their business model and becoming innovation hubs for established firms. Through an interview-based study of accelerators worldwide, the study maps the different ways through which accelerators create value for incumbent firms by supporting them engage in corporate entrepreneurship activities. While the literature on corporate entrepreneurship has mostly focused on solutions and activities that firms pursue within their boundaries, this study explores how established organizations can enact entrepreneurial behaviors and foster innovation across boundaries by collaborating with accelerators. In the third paper, we explore how innovation intermediaries can serve as boundary organizations to help incumbent firms and new ventures from different industries work together to create innovations. Through a field study of an open innovation program in Fashion-Tech called ‘Exploration program’, our analysis shows that firms face different and evolving ambiguities as they seek to collaborate across knowledge domains. Boundary organizations, in turn, help mitigate such ambiguities through different types of boundary work. Differently from studies that have conceptualized boundary organizations as enduring entities whose role remains stable over time, our findings illuminate that, when supporting the creation of innovation across knowledge domains, boundary organizations act as *morphing mediators* on which firms can tap upon when needed. Our findings promote a temporal, process view on the dynamic role of boundary organizations in inter-organizational relations, and have implications for theory and future work on boundary organizations, boundary work, and inter-organizational relations.

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INTRODUCTION

Positioning

Exploration, the process through which individuals and organizations engage in “search, variation, risk-taking, experimentation, play, flexibility, discovery [and] innovation” (March, 1991: 71) in order to develop new skills and capabilities (Lavie, Stettner, & Tushman, 2010) is extremely important for organizational creation, renewal and growth (Bhardwaj, Camillus, & Hounshell, 2006; McDonald & Eisenhardt, 2019; Murray & Tripsas, 2004; Raisch & Tushman, 2016), emergence of new organizational forms, industries and markets (David, Sine, & Haveman, 2012; Rindova & Kotha, 2001; Santos & Eisenhardt, 2009; Zuzul & Tripsas, 2019), and organizational survival after disruption of existing ones (Cozzolino, Verona, & Rothaermel, 2018).

Exploration has been historically conceived as the opposite of exploitation – which, by contrast, entails “allocating resources to refinement of existing technologies and the leveraging of existing competencies” (Lavie et al., 2010: 115). By treating exploration and exploitation as ends of a continuum, scholars adopting this perspective have put forward a conceptualization of exploratory and exploitative tasks as competing, and a view of organizations struggling to allocate scarce resources to one or the other. More recently scholars have proposed an alternative conceptualization of the relationship between exploration and exploitation as subsequent and complementary rather than competing tasks (Lavie et al., 2010), whereby exploration – which entails opportunity recognition and experimentation (Shane, 2012; Shane & Venkataraman, 2000) – precedes exploitation – which entails increasing familiarity, refinement, and routinized actions. Engaging in exploration, therefore, is an effort that all individuals and organizations face as they seek to create and introduce innovations, before they gain familiarity with them and evolve into exploitative activities and behaviours. The question of how firms organize along such continuum, and which new ways of organizing for innovation are emerging and gaining importance, therefore, is of critical importance for research at the nexus of entrepreneurship, strategy, and organization theory.

Because of its crucial importance, this question has sparked the interest of scholars within different research traditions. Researchers interested in the emergence and growth of new firms have shed light on how these firms organize for exploration as they grow by engaging in processes such as ongoing morphing (Rindova & Kotha, 2001), effectuation and bricolage (Baker & Nelson, 2005; Sarasvathy, 2001), organizational boundaries shaping (Santos & Eisenhardt, 2009), pivoting and creating revision (Grimes, 2018; McDonald & Gao, 2019; Ries, 2011), and business model development and experimentation (Alvarez, Barney, & Anderson, 2012; Andries, Debackere, & Looy, 2013; Martins, Rindova, & Greenbaum, 2015; McDonald & Eisenhardt, 2019; Snihur & Zott, 2019). Scholars interested in exploration within established firms have focused on how incumbents pursue opportunities by reshaping the boundaries between seemingly contrasting fields or logics (e.g., Dalpiaz, Rindova, & Ravasi, 2016) as well as between knowledge workers (such as R&D professionals) and their identity (e.g., Lifshitz-Assaf, 2018), and have recognized the increasing importance of approaches such as corporate entrepreneurship (Covin & Miles, 1999; Guth & Ginsberg, 1990; Hampel, Perkmann, & Phillips, 2019; Wadhwa & Kotha, 2006) and open or distributed innovation (Chesbrough, 2003; Dahlander & Gann, 2010; West & Bogers, 2017). Finally, scholars interested in how exploration can result from the interaction among people and organizations have focused on the emergence of multilateral collaboration settings (Ansari, Garud, & Kumaraswamy, 2016; Davis, 2016; Giudici, Reinmoeller, & Ravasi, 2018; Powell, Koput, & Smith-Doerr, 1996), inter-organizational relations (Deken, Berends, Gemser, & Lauche, 2018; Koza & Lewin, 1998; Parmigiani & Rivera-Santos, 2011), as well as multifunctional teams and cross-domain collaborations (Bruns, 2012; Carlile, 2004; De Groote & Backmann, 2019; Eisenhardt & Tabrizi, 1995; Zuzul, 2019).

This thesis builds on and aims to extend this exciting conversation by focusing on two increasingly essential ways through which firms organize for exploring and exploiting innovation opportunities: novel business models and inter-organizational collaborations across domains of expertise. The thesis includes three standalone research papers that, though building on different

bodies of research, converge topic-wise in that they all explore emerging and important ways through which new and established firms organize for exploration.

Three essays on emerging ways of organizing for exploration

In Chapter 1, entitled “Business model innovation and entrepreneurship: a review and integrative framework for future research”, I explored how entrepreneurship scholars have studied one of the key determinants of entrepreneurial firms’ success on the market, that is their business model (Lavie, Stettner, & Tushman, 2010). Through an in-depth literature review, the study aims at complementing the important yet still emerging conversation about the importance of business models for entrepreneurship research (George & Bock, 2011), focusing not on business models per se but on how individual entrepreneurs and established organizations ideate, develop, execute, and adjust novel business models over time (Demil & Lecocq, 2010; Foss & Saebi, 2017; Laudien & Daxböck, 2017b; Snihur & Zott, 2019; Sosna, Trevinyo-Rodríguez, & Velamuri, 2010) – that is, how they create, introduce, and profit from business model innovations (BMI) (Amit & Zott, 2012; Chesbrough, 2010; Desyllas & Sako, 2013; Foss & Saebi, 2017; Snihur & Zott, 2019). Despite scholars agree that business model innovation and entrepreneurship are closely interrelated constructs, and research at the intersection of these two fields is rapidly growing (Demil, Lecocq, Ricart, & Zott, 2015; Foss & Saebi, 2017; McDonald & Eisenhardt, 2019; Schneider & Spieth, 2013; Spieth, Schneckenberg, & Ricart, 2014), past research has nonetheless pointed at a surprisingly lack of systematic explanations as for how these two bodies of research have been related in the past, and why they are important for one another. To address this omission and create order in accumulated knowledge on entrepreneurship and BMI, I started this study with the following research questions:

RQ1: What have we learned from research at the intersection between entrepreneurship and business model innovation? And which directions are emerging for research going forward?

To answer these questions, I conducted a multi-method literature review of two decades of research on entrepreneurial ideation, design, and execution of new business models. I combined a bibliographic coupling analysis (Kessler, 1963; Zupic & Čater, 2015) of 4149 unique references with a meta-synthesis (Hoon, 2013; Jensen & Allen, 1996) of the 102 papers citing them across 65 academic journals.

Bibliographic coupling is a bibliometric method that is particularly germane to analyze new and emerging bodies of research, as it measures similarity among papers based on the references they share, without taking into account the number of citations received by each article – thus avoiding bias for newly published papers for which citations have not yet accumulated. Through bibliographic coupling, I reconstructed the network of studies at the intersection between entrepreneurship and BMI, and divided it in four main communities. Based on this network and its communities, my findings show that studies at the intersection between these two domains draw on a cohesive knowledge base, and span multiple topics related to opportunity identification, entrepreneurial organizing, entrepreneurial decision-making, and contextual influences on entrepreneurial endeavours. My analysis offers a thematic map of this body of research, organized around three main research questions: i) *How do individual entrepreneurs and firms identify opportunities to create new business models?* ii) *How do new and established firms enact and exploit opportunities through the design of new business models, and what is the impact of uncertainty on this process?* And iii) *How do firms acquire and combine the resources they need to design and execute new business models, and what is the role of markets and intra-firm contexts in these processes?*

For each of these questions, I uncover the different sub-themes on which scholars have focused, disentangle and summarize the topics associated to each conversation, trace progress, and assess emerging research opportunities. The results of my analysis indicate that business model innovation can be conceived as a journey along which new and established firms experiment with multiple configurations of resources and activities, test them on the market and incorporate feedback from various stakeholders, and eventually select the unique configuration that yields the

highest value creation potential. The review enables scholars to assess and take stock of current and emerging research topics in the area of entrepreneurship and business model innovation, and identify avenues to contribute to the literature.

Chapter 2, entitled “Fostering corporate innovation through collaboration with accelerators: a typology”, is an empirical investigation of a recent case of business model innovation, the transformation of business accelerators (Cohen & Hochberg, 2014; Cohen, Bingham, & Hallen, 2018; Drori & Wright, 2018) from organizational sponsors for new ventures to open innovation intermediaries and innovation hubs offering corporate education and fostering collaboration between startups and established firms. Accelerators are a new organizational form (Cohen et al., 2018) that is particularly germane for established firms’ corporate entrepreneurship activities, due to their distinctive expertise on growing startups and their central positioning within entrepreneurial ecosystems (Drori & Wright, 2018; Ketan Goswami, Mitchell, & Bhagavatula, 2017). Despite the transition of accelerators to ‘monetization through startups equity investments’ to new ‘corporate as a client’ models (e.g., Cohen, Fehder, Hochberg, & Murray, 2019; Tracey, Dalpiaz, & Phillips, 2018) is a growing global trend¹ in this industry, research on this new role of accelerators in the corporate and open innovation landscape is substantially lacking. On the one hand, corporate entrepreneurship scholars who have long sought to explore how incumbent firms can enact entrepreneurial behaviour by engaging in activities such as strategic renewal, corporate venturing, and more recently corporate accelerators (Burgelman, 1983; Guth & Ginsberg, 1990; Shankar & Shepherd, 2018) have devoted much attention to activities that established firms can pursue independently and within their boundaries, and mostly neglected solutions that reside outside the boundaries of the firm, such as those offered by innovation intermediaries such as –

¹ As demonstrated by recent empirical evidence such as, for instance, the 2016 Global Accelerator Report provided by Gust and the Global Accelerator Learning Initiative (available at: <https://www.galidata.org/accelerators/>) and the 2016 report provided by the European Accelerator summit (available at: <http://www.europeanaccelerators Summit.com/wp-content/uploads/sites/14/2016/12/acceleration-today.pdf>)

but not only limited to – accelerators. On the other hand, the vibrant yet still emerging body of work on accelerators has largely focused on their importance for new ventures or as programs that corporations can design and run themselves, and largely ignored alternative forms of collaboration between independent accelerators and established firms. This paper tackles these omissions by addressing the following research question:

RQ2: What are the different ways through which corporates can collaborate with accelerators to foster corporate entrepreneurship and innovation?

To answer this question, we conducted an inductive, interview-based study of accelerators globally, including complementary observations and archival data collection (Edmondson & Mcmanus, 2007; Fayard, Stigliani, & Bechky, 2017). Our findings reveal four different ways through which accelerators help corporations innovate: i) *vertical acceleration programs (verticals)*; ii) *scouting services*; iii) *pilot experimentation programs (pilots)*; iv) *intrapreneurship programs*. For each of these different solutions (verticals, pilots, scouting, and intrapreneurship programs), we explain in-depth their rationale and functioning, including the requirements for startups selection, the goals that corporations participating in these programs can achieve, the different levels of involvement required to corporate managers and employees, and the advantages in relation to more established corporate innovation modes such as internal R&D, corporate venturing, and corporate-owned acceleration program. Based on these findings, we develop a typology that distinguishes these different engagement modes between accelerators and corporations along two dimensions: the extent to which they are designed to serve well-specified on unspecified corporate innovation needs, and their focus on fostering innovation within a single corporate or for networks of multiple corporates and startups. This study contributes to the literature on corporate entrepreneurship and accelerators. First, we show how corporate entrepreneurship can be enacted across boundaries, and provide a rationale as for how accelerators – as other intermediaries – can help corporations overcome the challenges of engaging in entrepreneurial activities themselves. Second, we

encourage a reconceptualization of accelerators as innovation intermediaries as opposed to programs, whose role is not only those of growing promising new ventures but also (and increasingly) to foster innovation at the intersection of incumbent firms and startups.

In Chapter 3, entitled “Boundary organizations as morphing mediators in inter-organizational collaborations across domains: A case in Fashion-Tech”, we explored how boundary organizations – intermediary or mediating organizations that allow independent actors or firms to collaborate for mutually satisfying ends (Guston, 1999, 2001; O’Mahony & Bechky, 2008) while preserving their individual interests – support established firms and startups belonging to different industries engage in collaborative open innovation. For this study, we chose a peculiar empirical setting, that is corporate-startup collaboration in the Fashion industry. Due to the increasing pervasiveness of digital technologies that have revolutionized the way consumers relate to fashion brands and shop, as well as the ways fashion products are created and distributed², fashion brands are increasingly seeking to collaborate with innovative tech ventures to harness the power of their technology solutions into organizational processes and methods, increase their agility in responding to fast-changing market needs, and learn new ways of working. Many of them, however, are opening their boundaries to collaboration with new ventures outside the domain of fashion for the first time, and therefore are increasingly seeking support from intermediaries or mediators to help them reach promising young tech ventures and collaborate across their diverging worlds. While corporate startups collaborations are challenging per se (Alvarez & Barney, 2001; De Groote & Backmann, 2019; Fortwengel & Sydow, 2018; Katila, Rosenberger, & Eisenhardt, 2008), they are even more so when involving organizations from distant domains such as fashion and high-tech seeking to collaborate for innovative ends (e.g., Carlile, 2004; Zuzul, 2019). Boundary organizations are increasingly important in this landscape, and yet significantly undertheorized. We still know little about how these organizations support organizations from different knowledge domains

² See, for instance, McKinsey and The Business of Fashion ‘The State of Fashion’ 2017, 2018, and 2019 annual reports.

overcome their differences and co-create innovation, the boundary work (Langley et al., 2019) that they perform to enable collaboration, and the temporal dynamics of such processes. In order to address this puzzle, we asked the following research question:

RQ3: How do boundary organizations enable and assist the formation and management of exploratory inter-organizational collaborations across domains?

To address this question, we conducted a field study (Eisenhardt & Graebner, 2007; Gephart, 2004) in one of such organization – a former accelerator that has now become an innovation hub for corporate innovation – combining observations, archival data collection, and semi-structured interviews. We analyzed an open innovation initiative called “Exploration Program” over 12 months. The program involved a global fashion firm and several digital startups and was designed and run by the innovation hub firm serving as a boundary organization between them. Our findings show that incumbent firms and startups seeking to collaborate across domains to co-create innovation face different types of ambiguity as they engage in strategizing, matching, and executing collaborative experimental projects. Boundary organizations, in turn, respond to these ambiguities serving different roles and performing different types of boundary work. While each type of boundary work solves the specific ambiguity at different stages of the process, it also creates new challenges that precipitate the emergence of new forms of ambiguity in the subsequent phases. As opposed to available studies on boundary organizations that have conceptualized their role as static and enduring over time, our findings illuminate that boundary organizations enable and assist exploratory inter-organizational collaborations across expertise domains by acting as *morphing mediators*, whose role dynamically adapts as the challenges faced by the collaborating parties evolve and change. By elaborating a process model of boundary organizations as morphing mediators in inter-organizational relations, we contribute to the literature on collaboration and innovation across organizational as well as knowledge boundaries, boundary work, and inter-organizational relations.

1

BUSINESS MODEL INNOVATION AND ENTREPRENEURSHIP: A REVIEW AND INTEGRATIVE FRAMEWORK FOR FUTURE RESEARCH

ABSTRACT

Although research at the intersection between entrepreneurship and new business models development is rapidly growing, a systematic investigation about how these two bodies of research have been related in the past and which directions are emerging for future research is still missing. In this paper, I review two decades of research at the intersection between entrepreneurship and business model innovation, combining a bibliographic coupling analysis of 4149 unique references with a meta-synthesis of the 102 papers citing them. The findings show a more cohesive body of research than is depicted in prior work, and uncover three main research communities and a variety of subsets on which scholars have focused, linking firms' pursuit of BMI and processes of opportunity identification, enactment, and exploitation. Based on these insights, this study offers an integrative framework and reframing of BMI from an entrepreneurial lens and proposes an interdisciplinary research agenda that scholars interested in conducting research at the intersection of entrepreneurship and BMI might use as a starting point for future investigations.

Keywords: business model innovation; entrepreneurship; bibliographic coupling; meta-synthesis

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INTRODUCTION

Entrepreneurship scholars have devoted growing attention to business models (BMs) as sources of novelty in existing industries or organizations over the last two decades (Foss & Saebi, 2017; George & Bock, 2011; Zott & Amit, 2007). Business Models are important determinants of entrepreneurial success (McDonald & Eisenhardt, 2019; Zott & Amit, 2007), since the business model of the firm is the mean through which entrepreneurial opportunities are enacted and transformed into profit (Amit & Zott, 2001; Chesbrough & Rosenbloom, 2002; George & Bock, 2011) and the business is narratively communicated to key stakeholders in order to gain support from them (Doganova & Eyquem-Renault, 2009; Garud, Schildt, & Lant, 2014). Business models are also important for understanding entrepreneurial organizing, in that they holistically represent the “organizational structures to enact a commercial opportunity” (George & Bock, 2011: 99) – that is, “the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities” (Amit & Zott, 2001: 511) – whose different design themes have important implications for the performance of entrepreneurial firms (Amit & Zott, 2001; Zott & Amit, 2007).

Recently, entrepreneurship scholars have increasingly shifted attention from the static concept of business model to the more dynamic construct of Business Model Innovation (BMI)- that is, the process through which organizations ideate, develop, execute, and adjust novel business models over time (Demil & Lecocq, 2010; Foss & Saebi, 2017; Laudien & Daxböck, 2017b; Sosna et al., 2010) in order to succeed and maintain competitive advantages in the long run (McDonald & Eisenhardt, 2019; Mitchell & Coles, 2003), as well as the outcome of such process itself. Available studies have highlighted that BMI is a “new and attractive” construct (Spieth, Schneckenberg, & Ricart, 2014: 262) for research lying at the nexus of strategy, entrepreneurship, and organization theory (Demil et al., 2015; McDonald & Eisenhardt, 2019), and research at the intersection between

entrepreneurship and BMI has burgeoned in recent years³ (e.g., Demil et al., 2015; Foss & Saebi, 2017; Spieth, Schneckenberg, & Ricart, 2014). The construct of BMI has been used to explain important entrepreneurship phenomena such as pivoting (Dewald & Bowen, 2010; Shepherd, Wennberg, Suddaby, & Wiklund, 2019), venture emergence and evolution in nascent industries (McDonald & Eisenhardt, 2019; Zuzul & Tripsas, 2019), investors' evaluations of entrepreneurial ventures (Fu & Tietz, 2019), and entrepreneurial organizations (Lampe, Kraft, & Bausch, 2019).

Despite such surge of interest in BMI and entrepreneurship, and general agreement among scholars about their close interrelation, past research has nonetheless pointed at a surprisingly lack of systematic explanations as for how these two bodies of research have been related in the past, and why they are important for one another. Scholars have argued that research at the intersection of entrepreneurship and BMI “has not received sufficient attention to date” (Foss & Saebi, 2017: 220), and that despite “academic research as well as managerial practice continuously devote substantial attention to business models and entrepreneurial behaviours [...] an essential and commonly ignored research field is the connection of the two research streams.” (Futterer, Schmidt, & Heidenreich, 2017). While the concept of BM itself and its importance for entrepreneurship research are relatively well understood (George & Bock, 2011; Massa, Tucci, & Afuah, 2017; Zott, Amit, & Massa, 2011), therefore, the same does not hold true for BMI.

To address this omission and create order in accumulated knowledge on entrepreneurship and BMI, this paper maps the research forefront of the study of entrepreneurial ideation, design, and execution of new business models. Specifically, this study (1) disentangles, organizes and summarizes the topics associated to this conversation, (2) traces progress and assesses emerging research opportunities, and (3) develops an integrative framework for research going forward,

³ Based on a preliminary analysis performed on the ISI Web of Knowledge database on August 10, 2018 covering the period 1985 – present in the Social Sciences Citation Index (SSCI) and SSCI-EXPANDED Core Collection, more than a thousand scholarly contributions on this topic appear on the ISI Web of Knowledge database since 2003 (most of them published over the last ten years), with a growth rate of 21% per year. The growth rate was calculated taking into account the period: 1993 – 2017.

starting from the following research questions: *(i) what have we learned from research at the intersection between entrepreneurship and business model innovation? And (ii) which directions are emerging for research going forward?*

To this end, this is based on a science mapping approach (Zupic & Čater, 2015), combining quantitative and qualitative methods. First, I use bibliographic coupling analysis (Kessler, 1963; Mura, Longo, Micheli, & Bolzani, 2018; Vogel & Güttel, 2013) on a network of 102 papers published between 2003 and 2018 in 65 journals citing 6059 previous scientific articles, to provide a map of the debate and understand which topics lie at its core. Compared to narrative reviews, bibliometric studies offer an objective and insightful methodology to understand the themes that dominate a research domain, and bibliometric techniques have been widely used by both entrepreneurship (Gartner, Davidsson, & Zahra, 2006; Lampe et al., 2019) and general management scholars (Zupic and Čater, 2015). I then thoroughly analyze the papers included in the sample using meta-synthesis (Hoon, 2013; Jensen & Allen, 1996; Walsh & Downe, 2005), an interpretive method that is particularly suited to build theory from qualitative evidence.

The findings show that studies at the intersection of entrepreneurship and BMI drive on a cohesive knowledge base, and have spanned multiple themes within the domain of entrepreneurship (such as topics related to opportunity identification, entrepreneurial organizing, entrepreneurial decision-making, and contextual influences on entrepreneurial endeavours). Specifically, the review identifies and synthesizes the results of three main sets of studies. For each set, I identify the overarching research questions addressed, as well as the underlying questions the papers included therein have sought to answer. Finally, this study suggests avenues for future interdisciplinary research on the ideation and execution of novel business models at the intersection of various domains, including entrepreneurship, strategy, and organization theory, and provides a meta-synthesis of research findings that can orient future research.

The insights from this review may be valuable for entrepreneurship and BMI scholars alike. First, this study complements previous research on the importance of business models for

entrepreneurship research (e.g., George & Bock, 2011), by shedding light on the importance of studying the dynamic process of ideation, design, selection, and adjustment of new business models to answer to many of the pieces that constitute entrepreneurship overarching puzzle (Shepherd et al., 2019) and provide opportunities for scholars to contribute to the literature in a cumulative fashion. This assessment is important to shed further light on the importance of BMI as a phenomenon whose implications span several central themes in entrepreneurship research, and timely considering the surge of research in this area. Second, this study disentangles the issues and research questions that have been addressed by studies lying at the intersection between entrepreneurship and BMI. This review complements previous reviews on BMI that have focused on providing a definition of the concept and highlighting gaps in scholarly understanding (Foss & Saebi, 2017, 2018), by providing instead a map of topics on which scholars have focused, and which may inform research going forward.

BACKGROUND

What does Business Model Innovation mean, and how is it related to entrepreneurship?

The importance of the concepts of Business Model (BM) and Business Model Innovation (BMI) has been widely recognized among management scholars over the past two decades (e.g., Massa et al., 2017; Zott et al., 2011; Foss and Saebi, 2017). The Business Model of the firm has been defined as “the design of organizational structures to enact a commercial opportunity” (George & Bock, 2011: 99), including firms “value creation, delivery, and capture mechanisms” (Teece, 2010: 172; Timmers, 1998: 4). For entrepreneurs, BMs are powerful cognitive tool to assess opportunity landscapes (George & Bock, 2011), categorize existing firms (Mangematin et al., 2003), guide entrepreneurial action (Chesbrough & Rosenbloom, 2002; Doganova & Eyquem-Renault, 2009; Perkmann & Spicer, 2010), and gain support from key stakeholders by making novel businesses understandable for them (Doganova & Eyquem-Renault, 2009; Garud, Schildt, & Lant, 2014).

The dynamic process through which novel BMs emerge over time to bring either modular or architectural innovation (Foss & Saebi, 2017, 2018) in existing firms or industries, in turn, constitutes Business Model Innovation (e.g., Foss & Saebi, 2017). BMI is a source of innovation that “complements the traditional subjects of process, product, and organizational innovation” (Zott et al., 2011: 1032), focusing instead on “the system of activities, as well as the resources and capabilities to perform them, either within the firm, or beyond it” (Zott and Amit, 2010: 217). Firms can identify opportunities for introducing novel BMs in existing industries or contribute to the emergence of new markets by modifying the existing BM of the firm or its configuration of parallel ones (Aversa, Furnari, & Haefliger, 2015; Cucculelli & Bettinelli, 2015; Kim & Min, 2015), or create entirely new models through processes of generative cognition (e.g., Martins et al., 2015).

BMI is an important topic for research and practice on new ventures emergence and growth and established entrepreneurial organizations, as summarized in Table 1. For startup companies, the identification and execution of innovative business models is an “entrepreneurial act” (Chesbrough, & Rosenbloom, 2002: 550) with important implications for their performance and growth (McDonald & Eisenhardt, 2019; Zott & Amit, 2007). Scholars have argued that, as new ventures are engaged in choices related to the design of novel business models in any of their activities, entrepreneurial endeavours are themselves “intrinsically linked to BMI” (Foss and Saebi, 2017: 220). Innovative business models are important means through which entrepreneurs’ ‘revolutionary’ identities are set in motion (Zuzul & Tripsas, 2019), and have critical implications for ventures’ growth trajectories (e.g., McDonald & Eisenhardt, 2019). For established firms, organizational endeavours aimed at adjusting, modifying, or radically change existing BMs are part of the entrepreneurial strategies through which they seek to secure competitive advantage in face of environmental evolution (Covin & Miles, 1999; J. A. Murray, 1984), for which they are required to exercise entrepreneurial judgment, vision, and uncertainty management strategies (Foss & Saebi, 2017, 2018; Schneider & Spieth, 2013).

-----INSERT TABLE 1 ABOUT HERE-----

As knowledge in both fields has accumulated (e.g., Foss & Saebi, 2017; Shepherd et al., 2019), a comprehensive, analytical assessment of research at the intersection between entrepreneurship and BMI research is timely to provide scholars interested in this conversation a useful map of extant research and potential avenues for future investigations. This assessment is important to answer scholars' recent calls for additional research at this crossroad (Andreini & Bettinelli, 2017; Foss & Saebi, 2017, 2018; Spieth et al., 2014), but also in light of recent empirical studies confirming this gap (Futterer et al., 2017; Reymen, Berends, Oudehand, & Stultiëns, 2017).

Boundary conditions for the review

In the last five years, Business Model Innovation (BMI) has been the subject of many literature reviews (see Table 1 for an overview). These reviews have been of crucial importance for delineating the boundaries of the concept of BMI (Foss and Saebi, 2017), summarizing the advancements of BMI research over the last two decades, and proffering avenues for future research on this topic. Altogether, they have shed light on the emergence of the debate on BMI as an evolutionary product of the less recent stream of research on business models (Foss and Saebi, 2017; Schneider and Spieth, 2013) which “incorporates a number of research questions that reach beyond the boundaries of traditional BM literature” (Foss and Saebi, 2017: 202), the streams of research around which the literature on BMI has revolved in terms of its antecedents, process of execution, role and relevance for the firm, and outcomes (Andreini and Bettinelli, 2017; Schneider and Spieth, 2013; Spieth et al., 2014), the theoretical lenses through which it has been analyzed and its fields of application (Foss & Saebi, 2017; Gassmann, Frankenberger, & Sauer, 2016), as well as the theoretical gaps that need to be addressed in order to get to a clear and congruent theoretical framework guiding BMI research in the future (Foss and Saebi, 2017).

Though inspired by these previous reviews, and taking full account of the insights contained therein, this paper pursues a different objective. Motivated by the recent call by BMI scholars to devote further attention to the investigation of the phenomenon through the theoretical lens of entrepreneurship (Andreini & Bettinelli, 2017; Foss & Saebi, 2017; Spieth et al., 2014; Wirtz,

Göttel, & Daiser, 2016), as well as the recent upsurge of empirical research confirming this interest (see, e.g., Futterer et al., 2018; Reymen et al., 2016), this paper aims at mapping research at the intersection of entrepreneurship and BMI, and which avenues are emerging to enrich this conversation. Coherently with this objective, I therefore *explicitly and purposefully focus only on theoretical and empirical research at the intersection between entrepreneurship and business model innovation.*

RESEARCH DESIGN

Database construction

To provide a comprehensive review of the literature on BMI from an entrepreneurship perspective, I began by first analysing the previously published literature reviews on BMI, looking for the specific keywords to be used for searching relevant publications (see Foss and Saebi, 2017, 2018; Wirtz, Göttel, and Daiser, 2016). This analysis yielded a comprehensive set of ten keywords related to Business Model Innovation, which I then used as criteria for the search for relevant papers to include in the review: “business model* innovation”, “business model dynamics”, “business model* evolution”, “business model* reinvention”, “business model* development”, “innov* business model”, “business model* renewal”, “business model* adjustment”, “new business model*”, “novel business model*”. In order to narrow down the scope of the search for papers adopting an entrepreneurship perspective, while at the same time ensuring a broad enough domain of research, I combined these ten keywords with just one search term related to entrepreneurship, “entrepreneur*”. A similar approach was used by, for instance, Vallaster et al. (2019) in a recently published review on entrepreneurship and ethics, and Shepherd and colleagues (2019) in a review of the many dependent variables that entrepreneurship research has investigated.

I searched for relevant publications on both the Scopus and Web of Science (ISI) databases. More specifically, in Scopus I searched for papers simultaneously containing one or more keywords related to BMI and “entrepreneur*” in the title, abstract, and authors’ keywords. The search was limited to the subject areas of “Business, Management and Accounting”, “Economics, Econometrics and Finance”, and “Social Sciences”, thus excluding non-business-related disciplines

such as Computer Science or Biological Science. For the sake of quality of publications, I only considered published articles, books, and book chapters, excluding non-published sources such as conference proceedings, without limiting the results to a particular time span. The search yielded 209 papers on August 6th, 2018. On the same day, I did a similar search in the ISI Web of Knowledge (ISI) repository, searching for the same keywords in the publications' abstracts, authors' keywords or keyword plus, using the "Topic" search function and limiting the search scope to the Science Citation Index Expanded (SCI-EXPANDED) and the Social Sciences Citation Index (SSCI) (1985 – present). Similarly, I searched in the "management", "business", "business finance", "social sciences interdisciplinary", "history of social sciences", "history philosophy of science", or "sociology" fields, including only articles, books and book chapters. The ISI database search yielded 384 results. Altogether, the two datasets formed an initial set of 593 contributions. After comparing the two sets and removing duplicates, 539 unique items remained (54 duplicates were thus removed). To ensure an adequate level of quality of the review while including only papers relevant for the research question, I subsequently defined a set of inclusion and exclusion criteria for the final set of contributions (Table 2).

-----INSERT TABLE 2 ABOUT HERE-----

The criteria were designed to exclude publications which mentioned the search terms but failed to explicitly use them in the development of the research, or that referred to the object of our study only marginally. Furthermore, to maximize the relevance of the research and the quality of the sample, I included in the final sample only articles whose publishing source is currently listed in the Academic Journal Guide (AJG 2018) of the Chartered Association of Business Schools (CABS), a standard practice in recently published literature reviews (Beer & Micheli, 2018; Franco-Santos & Otley, 2018). After accurately screening the abstracts and the publishing sources according to the inclusion criteria, I excluded 437 items from the initial dataset (102 contributions retrieved from Scopus, and 335 from ISI). The final dataset included 102 articles published between

2003 and 2018, of which 54 retrieved from Scopus and 48 from ISI. I downloaded all 102 items in BibTeX format, including full details and reference lists.

Data analysis

To analyze the data, I used a science mapping approach (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011; Zupic & Čater, 2015) combining quantitative and qualitative methods. According to Zupic and Čater (2015: 429), the aim of science mapping is to “examine how disciplines, fields, specialities, and individual papers are related to one another” by means of bibliographic methods, in order “to create a representation of the research area’s structure by partitioning elements (documents, authors, journals, words) into different groups.” (Zupic and Čater, 2015: 429, 430). Data analysis unfolded in five steps, presented below.

Step 1: Choice of the bibliometric method. Three preliminary considerations drove the choice of the most suitable bibliometric method to analyse the data. First, this review aims at mapping the landscape of research at the intersection of entrepreneurship and BMI. Second, although publications generally mentioning BMI or one of its synonyms can be traced back in 1993⁴, this body of research has developed mainly since 2010⁵. Third, research on BMI is non-cumulative, with few papers citing each other systematically (Foss and Saebi, 2017).

Considering Boyack’s & Klavans’ (2010) recent analysis on the accuracy of different bibliometric methods, as well Zupic’s and Čater’s (2015) prescriptions, I chose bibliographic (or bibliographical) coupling (Kessler, 1963) as the most appropriate method for this study. As argued by Zupic and Čater (2015: 439), “examining the research front of a topic or research field is a task

⁴ According to a preliminary analysis performed on the ISI Web of Knowledge database on August 10, 2018, covering the period 1985 – present in the Social Sciences Citation Index (SSCI) and SSCI-EXPANDED Core Collection, the same search criteria detailed at paragraph 2.1, without any further exclusion of results.

⁵ According to a preliminary analysis performed on the ISI Web of Knowledge database on August 10, 2018 covering the period 1985 – present in the Social Sciences Citation Index (SSCI) and SSCI-EXPANDED Core Collection, more than 75% of the total number of papers on BMI (1008 according to the same search criteria detailed at paragraph 2.1, without any further exclusion). The highest number of publications was reached in 2017, with 152 papers published contributions. Recently published literature reviews on BMI (e.g., Andreini and Bettinelli, 2017; Foss and Saebi, 2017; Wirtz et al., 2016) confirm these figures.

particularly suitable for bibliographical coupling since this method uses reference lists for coupling and does not require the documents to be cited in order to connect them.” Compared to other methods aimed at building theory from textual data – such as content analysis and topic modelling – which are generally aimed at studying the content of large corpuses of textual data composed by thousands or tens of thousands of documents (Asmussen & Møller, 2019; Hannigan et al., 2019; Reisenbichler & Reutterer, 2019) whose large size would make manual coding difficult to manage, bibliographic methods are well-suited for analysing and clustering “niche specialities” (Zupic and Čater, 2015: 434) formed by smaller and less cited sets of documents, and for disentangling the intellectual structure (i.e., the connections among different research groups) of recent and emerging fields of research (Zupic and Čater, 2015) by unveiling the citation links among published articles. The choice to use a bibliometric method instead of a content analysis technique such as topic modelling was thus driven by two main factors: first, the aim of the study – namely, mapping both the knowledge base and the content of the studies included in the dataset; second, the availability of data – a relatively small sample compared to the large corpuses used for topic modelling analyses – which allowed for a deeper examination of the content of each article performed by the researcher, for which the bibliometric analysis would serve only as a starting point.

Differently from other bibliometric methods such as co-citation analysis, bibliographic coupling displays the connections between co-citing documents and thus shifts the unit of analysis from cited to citing documents (Boyack & Klavans, 2010; Vogel & Güttel, 2013). This methodological difference is particularly relevant in the case of young bodies of research such as BMI (Foss & Saebi, 2017), as it allows to avoid biases in the analysis due to the exclusion of newer (and, by consequence, comparatively less cited) articles. The typical output of a bibliographic coupling analysis is a network of publications that are connected among each other on the basis of the references they share (Kessler, 1963; Zupic and Čater, 2015), under the assumption that these connections reflect some degree of content similarity between the coupled documents (Vogel and Güttel, 2013).

Step 2. Construction of the bibliographic database and pre-processing. I combined the data retrieved from Scopus with those retrieved from Web of Science in order to obtain a single unified dataset. To perform this task, I used an R-package called bibliometrix (Aria & Cuccurullo, 2017), designed explicitly for bibliometric analyses. I first loaded the two datasets in BibTeX format separately into R, transformed each collection into a data-frame, and subsequently merged the two data-frames (Aria and Cuccurullo, 2017). After merging the two datasets, I moved to the pre-processing step (Cobo et al., 2011) in order to improve the quality and reliability of the data. Pre-processing involved four steps: (ii) de-duplicating; (iii) checking for completeness of the data – that is, checking if all rows of our dataset contain complete information, with special regards to the list of references; (iii) correcting misspellings errors (such as, for instance, the same author’s name or surname or the same journal written in ways), and (iv) matching the references style of the two datasets to create the appropriate links between the papers. I checked for duplicates using the bibliometrix package, finding no duplicates in the merged sample. I then manually checked and cleaned the data, scanning the full list of references to check for misspelling errors and match the shared references between documents. This step was critical to ensure the quality of the data⁶. Since ISI and Scopus use different references styles, the coupling network cannot be created without accurate matching. This is because references must be written in the same format to allow the construction of an accurate co-occurrence matrix, which then serves as a basis for the coupling network.

Step 3. Data analysis. After pre-processing and cleaning the data, I began the analysis by computing a co-occurrence matrix. This is a rectangular binary matrix, which represents a bipartite network whose rows are the manuscripts in the dataset (n=102) and columns are the unique cited references (n=4149) among the total cited references (n=6059). In the generic co-occurrence

⁶ I found, for instance, more than five different spellings just for ‘Entrepreneurship Theory and Practice’, written as “ENTREPRENEURSHIP: THEORY and PRACTICE”, “ENTREP. THEORY PRAC.”, “ENTERPREN. THEOR. PRACT.”, and “ENTREPRENEURSHIP THEORY AND PRACTICE.”

matrix A , for example, the generic element a_{ij} is one if the manuscript i cites the paper j , zero otherwise (Aria & Cuccurullo, 2017). The absolute number of documents citing each unique reference can be computed as the sum of each column, which can be used to find the most cited references in the collection. I then computed the sum of each row of the co-occurrence matrix to check for the absolute number of references cited by each article, and used this sum to check for the accurateness of the cleaned data. I performed this check multiple times, correcting for remaining errors (e.g., special characters that created noise in the data) until no substantial differences were found. I then used the co-occurrence Document x Cited reference matrix to compute the coupling network using the following generic formula:

$$B = A \times A'$$

Where A is the generic Document x Cited reference co-occurrence matrix (Aria & Cuccurullo, 2017; Kessler, 1963), and B is a symmetrical matrix whose rows and columns are the documents in the sample (in this case, since the dataset includes $n=102$ articles, B is a 102×102 matrix). In this network, a tie between two paper is formed if they have at least one cited reference in common. The connection strength between two papers, therefore, is based on the number of coupling units (i.e., references) they share. In the coupling network, such number is given by the generic element b_{ij} of the B matrix (Aria & Cuccurullo, 2017). The elements in the diagonal of the coupling network B represent the total number of references per each article (i.e., the number of references that each article shares with itself). To avoid bias toward papers with only a few references, I normalized the coupling network using the association strength similarity measure (Van Eck and Waltman, 2010).

Step 4. Identification of subfields and data visualization. To create a thematic map of studies on entrepreneurship and BMI, I further processed the bibliographic coupling network using network analysis to identify relevant sub-fields based on similarity among the papers in the collection (as reflected by the normalized coupling links). Following Zupic's and Čater's (2015)

prescriptions as well as the approach followed by recently published bibliometric studies using bibliographic coupling (e.g., Mura et al., 2018), I detected the communities in the network using the Louvain-community finder algorithm (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008), which allows to divide the network into subsets of densely inter-connected nodes (Blondel et al., 2008; Zupic and Čater 2015). This community-detection algorithm is particularly accurate because it optimizes “the density of links *inside* communities as compared to links *between* communities” (Blondel et al., 2008: 2, emphasis added) – i.e., the modularity of the partition. It does so by: first, assigning and re-assigning each node in the network to a community until the maximum modularity is reached and no further improvements can be achieved; second, building a new network where the nodes are the communities found during the first stage; third, reapplying and iterating these two steps until there are no more changes in each community structure and the number of communities is minimized to obtain the maximum global modularity. Because such modularity optimization allows to objectively measure and optimize the meaningfulness of the network division into sub-groups (Zupic’s and Čater, 2015), it is a highly desirable characteristic for bibliometric studies aimed at mapping the forefront of a field of research for it optimizes the number of communities into which the nodes are divided, as well as the connection strength among them compared to the other communities.

Before computing the partitioning, I removed the isolated nodes and reduced the sample from 102 to 100 nodes. As additional control, I repeated the procedure with a control coupling network computed through the R *bibliometrix* package using the *biblioAnalysis* command (Aria & Cuccurullo, 2017). I did not find any difference in the network structure and in its partitioning using the Louvain-community finder algorithm. I then visualized the network structure using the Kamada–Kawai layout algorithm (Mura et al., 2018; Zupic and Čater 2015), using the R *iGraph* package to compute the partitioning and visualize the network⁷. This allowed me to, for instance,

⁷ This choice was driven by the flexibility and the large number of options for both community finding and network visualization offered by *iGraph* for R.

iteratively try different visualization algorithms before selecting the preferred visualization. The Louvain-community finder algorithm divided the coupling network into four distinct communities.

Step 5. Analysis and interpretive coding of papers within clusters. As Zupic and Čater (2015: 448) effectively explain, “bibliometrics is no substitute for extensive reading in the field” and “documents that appear in the analysis need to be thoroughly examined to reach valid conclusions.” As a final step, I thus closely examined all the papers included in the four communities. To do so, I initially focused on each paper’s structure (Zupic and Čater, 2015) to extract information about the research focus, the main research question(s), the method used, the study context and the ideas developed in each paper. From this preliminary analysis, I found that the studies in the dataset are mostly qualitative studies based on single or multiple cases studies. Considering the aim of the review of providing an integrative framework to orient future research, I thus used meta-synthesis (Hoon, 2013; Jensen & Allen, 1996; Walsh & Downe, 2005) as analytical approach to synthesize the past research findings and reconcile them in an integrative framework. Following Hoon (2013), the three initial steps for building theory through meta-synthesis overlap with those of science mapping (namely, framing the research question, locating relevant research, and defining the inclusion/exclusion criteria). Starting from the fourth step (extracting and coding the data), I initially coded the papers included in each cluster individually, focusing on whether each study addressed the antecedents, process, contingency factors, or outcomes of BMI. I then used Shepherd et al. (2019) framework to code each paper (single-case analysis) according to whether the findings and implications of each study were aimed at informing research on the initiation, engagement, performance, or contextualization of entrepreneurial endeavours. Following this coding scheme, I then moved from case-specific to cross-case analysis and found that studies within community one related to opportunity identification (initiation), studies within communities two and four related to opportunity enactment and exploitation (engagement), and studies within community three related to contingency factors (contextualization). I did not find a

separate community related to the performance implications of BMI (performing)⁸. As a result of the cross-case analysis, I used the findings from the studies in each cluster to reconcile and synthesize them in a unified framework. In the next section, I present and elaborate on the results from these analyses.

RESULTS OF THE BIBLIOMETRIC ANALYSIS

The final dataset includes 102 items published between 2003 and 2018 in 65 journals, with an annual growth rate of 21,90% (Figure 1). The annual growth rate mirrors the general trend observed in BMI research more in general⁹, confirming the importance of this conversation in the field. The 102 papers in the dataset cite 4149 unique references.

-----INSERT FIGURE 1 ABOUT HERE-----

Table 3 provides an overview of the 20 most cited articles in the sample. The most cited articles focus on providing a definition of the BM as architecture of the firm's system of activities and transactions, which explains how firms create and capture value (Amit & Zott, 2001; Zott et al., 2011), and serve as heuristic (Chesbrough & Rosenbloom, 2002) through which entrepreneurs cognitively identify and assess the development path along which they want to develop their ventures based on their value creation potential. Others highly cited studies focus on the importance of firms' ability to dynamically fine-tune (Demil & Lecocq, 2010) and renovate their business model over time, following experimental, trial-and-error processes (Chesbrough, 2010; McGrath, 2010). These abilities, in turn, are important to keep the pace with – or even anticipate – environmental change (Sosna et al., 2010) and potentially disrupt existing industries (Johnson et al., 2008). Highly cited studies shed also light the importance of different themes along which

⁸ Studies about the performance implications of BMI for entrepreneurial firms were included in each community and did not form a separate group.

⁹ According to a preliminary analysis performed on the ISI Web of Knowledge database on August 10, 2018, covering the period 1985 – present in the Social Sciences Citation Index (SSCI) and SSCI-EXPANDED Core Collection. The growth rate was calculated taking into account the period: 1993 – 2017.

business models can be designed (Amit & Zott, 2001), which serve as synthetic classification devices to synthesize, describe, and classify different businesses (Baden-Fuller & Morgan, 2010) and can impact the performance of the ventures developing them (Zott & Amit, 2007).

-----INSERT TABLE 3 ABOUT HERE-----

To assess and visualize similarities between the paper in the dataset, I first computed a Document x citation co-occurrence matrix that indicates which paper cites which reference. On the basis of this matrix, I then computed the coupling network as a symmetrical, adjacency matrix¹⁰ whose rows and columns are the documents in the sample (n=102). I normalized the connection strength between the nodes using the association strength similarity measure (van Eck & Waltman, 2010), and visualized it using the Kamada–Kawai layout algorithm. Before computing the network graph, I removed two isolated nodes (i.e., papers with no shared references) and removed all loops in the network. Figure 2 shows the bibliographic coupling network resulting from these analyses.

-----INSERT FIGURE 2 ABOUT HERE-----

The papers in the network are linked by 2897 edges, and the network density is 0.585, which means that more than 50% of the possible links between the network nodes are actualized, with an average degree per node of 58. Considering that an edge between two nodes (i.e., papers) exists if they have at least one reference in common, density is an important bibliometric indicator for it “reflects the extent to which various streams within a subfield of research pursue their agendas on common grounds.” (Vogel & Güttel, 2013: 430) This finding thus suggest that the articles in the sample share a similar knowledge base. I then detected the different communities present in the network using the Louvain-community finder algorithm (Blondel et al. 2008). The algorithm found four communities in the bibliographic coupling network. The largest communities are 1 and 3 (with 39 and 32 nodes each, respectively), while community 2 and 4 respectively have 16 and 13 nodes each. Figure 3 shows the network with the nodes coloured on the basis of the community they

¹⁰ As an adjacency matrix, the generic element b_{ij} of the coupling matrix answers to: ‘does paperX share at least one cited reference with paper Y?’

belong to. Table 4 provides the details about each node in the network. After detecting the community structure, I used these results as a basis for the interpretive study of all the papers. I elaborate on this analysis in the next section.

-----INSERT FIGURE 3 ABOUT HERE-----

-----INSERT TABLE 4A ABOUT HERE-----

RESEARCH COMMUNITIES AND META-SYNTHESIS

Coherently with the aim of mapping research at the intersection of entrepreneurship and BMI, I used Shepherd and colleagues' (2019) framework as a guide to make sense of the papers in each community in relation to dominant themes in entrepreneurship research. I found that papers in the first community relate with the initiation of entrepreneurial endeavours aimed at identifying opportunities for BMI, papers in the second and fourth communities relate with the engagement of entrepreneurial endeavours aimed at developing novel BMs and bringing them to the market – what Shepherd and colleagues (2019) call “Engaging entrepreneurial endeavours” – and papers in the third community relate with the endogenous and exogenous contextual influences that may impact entrepreneurial business modelling. Table 5 provides an overview of representative articles within each research group, a short description of the phenomena that they address, and a summary of the overarching research questions to which they answer. A more detailed elaboration of each group is provided in the next section.

-----INSERT TABLE 5 ABOUT HERE-----

The ideation of novel Business Models

Studies in the first set (community 1) mainly focus on how ideas for the creation of new business models are generated at both the individual and organizational level, as well as on what is the role of business models in supporting firms develop a value proposition for different markets and appropriate value from it. The papers in this cluster answer to three main overarching research questions: i) *How do entrepreneurs and managers ideate new business models and what are the triggers of the ideation process?* ii) *what is the role of business models in supporting the opportunity identification process?* And iii)

which tools can be used by managers and entrepreneurs to frame opportunities in business models terms, and what is the role of such tools in helping them select which opportunities are worth pursuing?

New business models ideation. The first subset of studies focuses on processes of ideation of new business models at both the individual and organizational levels of analysis. Specifically, these studies focus on the cognitive and practical triggers that lead individual entrepreneurs and corporate managers to identify opportunities for renewal of current business models (at both firm- and industry-level) and initiate processes of experimentation that lead to BMI.

At the individual level, for instance, Martins et al. (2015) focus on cognitive processes through which ideas for new business models are generated, and show how two cognitive processes that individuals typically use to cope with novelty (i.e., analogical reasoning and conceptual combination) can lead entrepreneurs and managers to ideate new business models in absence of stimuli coming from the environment (e.g., new technologies, new entrants, or sudden changes in consumers' preferences) and thus disrupt existing industries. Conversely, Svejenova and colleagues (2010) show that the initial conception of a business model is triggered by individuals' overarching interests and motivations (such as, in this case, a chef's quest for creative freedom). As individuals' careers progress, stage-specific triggers lead to changes in individuals' motivations and interests which, in turn, unlock cycles of business model transformation (Svejenova, Planellas, & Vives, 2010).

A more extensive set of studies focuses on BMI opportunity identification triggers at the organizational level of analysis. (Bohnsack, Pinkse, and Kolk (2014), for instance, analyze the emerging market of electric vehicles focusing on the role of path dependencies and knowledge gained in adjacent industries in enabling or hindering the ideation and development of new business models by both incumbent firms and new ventures. They show that path dependency and adjacent industry knowledge impact the initial phase of emergence of new business models in different ways for incumbent firms and new ventures, and thus lead these two types of firms to approach

opportunities to introduce novel BMs differently. While incumbents are initially tied to developing efficiency-enhancing business models that are designed to resist to environmental changes over time, new ventures initially pursue more radical and novelty-oriented business models, but are more likely to switch to less costly options over time as they progress from the startup to the scale-up phase. Conversely, (Laudien & Daxböck, 2017a) investigate how average market players identify BMI opportunities, and shed light on the trial-and-error experimentation processes through which these firms approach BMI by identifying misfits between firms' external environment and their current BMs.

A smaller subset of studies quantitatively investigate BMI drivers in entrepreneurial firms. Futterer et al. (2017), for instance, study the effectiveness of effectuation and causation (Sarasvathy, 2001) as BMI opportunity recognition logics in the context of corporate venturing activities, and Guo, Su, and Ahlstrom (2016) propose that firms' exploratory orientation and their ability to recognize BMI opportunities is mediated by the pursuit of concrete actions and practice as well by firms' entrepreneurial bricolage capabilities (Baker & Nelson, 2005).

Opportunity identification through business model thinking. A second interesting set of studies more explicitly focuses on the potential of thinking in business model terms to support the opportunity identification process and the initial pursuit of entrepreneurial endeavours across a variety of settings.

Some studies explicitly focus on the challenges that entrepreneurs may face in assessing the opportunity landscape, and develop arguments on how thinking in business model terms can help managers and entrepreneurs overcome them. Reymen, Berends, Oudehand, & Stultiëns (2017), for instance, highlight the challenges inherent in technology commercialization, and shed light on how the initial identification of the critical business models components (i.e., a compelling value proposition, and an under-served market segment) help entrepreneurs choose a technology development path, manage uncertainty during technology development, and bring a first prototype to the market. Similarly, Broekhuizen, Bakker, & Postma (2018) shed light on three alternative

paths through disruptive innovators can introduce novelty in existing industries (i.e., competing on superior perceived value, competing on prices, or competing on both value and price through hybrid models), and (Ogilvie, 2015) studies how the design of ecosystem-based business models enables firms to develop new technology-based services.

A small group of papers in this set systematically test the relationship between opportunity recognition, BMI, and firms' performance. Velu (2015), for instance, shows that when considering which opportunities to pursue new firms should seek for either very cautious improvements of existing BMs or radical innovation, while intermediate levels of BM innovativeness are detrimental for new ventures' survival. Similarly, Guo, Tang, Su, & Katz, (2017) find that innovative business models are opportunity-exploitation devices that mediate the relationship between opportunity recognition and the performance of SMEs.

Frameworks and tools to support business model thinking and opportunity identification. A final, smaller group of studies focus on the practical tools that can support managers and entrepreneurs analyze markets and existing business models, identify opportunities to systematically renovate them as they see fit with changing environmental conditions, and decide whether and how such opportunities are worth pursuing. These tools include conceptual and visual frameworks (Breuer, Fichter, Lüdeke-Freund, & Tiemann, 2018; Garcia-Gutierrez & Javier Martinez-Borreguero, 2016; Günzel & Wilker, 2012; Seidenstricker & Linder, 2014) as well as scenario analysis (Bouwman et al., 2018) and computer simulations (Yan, 2018). These studies typically illustrate the validity of specific a specific tool to visualize opportunities and frame them in business model terms, and test its effectiveness in real-world case studies.

Assessment and summary

Studies in the opportunity identification and BMI ideation set focus on the triggers that lead individual entrepreneurs and organizations to identify opportunities for introducing novelty in existing firms or industries by designing novel business models. Studies in the first subset (Business Model ideation) identify both cognitive (intangible) and concrete (tangible) factors

serving as triggers for the ideation process. Cognitive, intangible triggers include entrepreneurs' motivations and passions (Svejenova et al., 2010), processes of generative cognition (Martins et al., 2015), knowledge from adjacent industries (Bohnsak et al., 2014), as well as specific opportunity recognition logics (Futterer et al., 2017). Conversely, tangible triggers include new technologies (Shin, 2014), complementary assets (Bohnsak et al., 2014), and the enactment of specific practices and resources for the purpose of innovation opportunities identification (Guo et al., 2016).

Studies belonging to the business model thinking subset explain how thinking in business terms enable entrepreneurs and managers to identify and frame entrepreneurial opportunities across a variety of empirical settings. These studies mostly focus on BMI in settings such as smart devices (Shin, 2014), digital and connectivity-enabled markets (Koçoğlu, Akgun, & Keskin, 2017; Ogilvie, 2015), technology development and commercialization (Reymen et al., 2017; Scaringella, 2018), universities (Gaus & Raith, 2016), and sustainable businesses (Davies & Chambers, 2018; Nieuwenhuis, 2018; Shalender, 2018; Todeschini, Cortimiglia, Callegaro-de-Menezes, & Ghezzi, 2017; Zebryte & Jorquera, 2017). While all these studies implicitly assume a positive relationship between opportunity identification, novel BM development, and various performance dimensions (such as firms' growth or survival), a smaller subset of studies statistically test this relation, confirming the positive relations between the identification of BMI opportunities and the performance of firms such as young ventures (e.g., Velu, 2015) and SMEs (Guo et al., 2017).

Finally, a smaller subset of studies focus on the practical tools that can support opportunity identification. These studies see business models as devices that allow entrepreneurs and managers to assess and rationalize potential opportunities, in order to quantify their value creation potential. Studies in this subset present and test practical frameworks, tools, and methods that support such processes leveraging on visualization and scenario analysis techniques. They see opportunities for BMI as stemming from the systematic and dynamic adjustment of a firm's BM over time as managers see fit with changes in the external environment. This entails mapping the network of transactions governing the firm's system of activities and the actors involved, identifying potential

opportunities based on these maps, evaluating alternative configurations, and finally assessing their value creation potential.

Emerging research opportunities

Studies in the first subset contribute to scholarly understanding of the triggers that lead individual entrepreneurs and managers of entrepreneurial organizations to identify opportunities to introduce new business models in existing firms or industries. Based on the review findings, there are many opportunities for future research to advance future research on this conversation. These include further investigations on (1) opportunity identification and individual business models; (2) BM ideation as a proactive, rather than reactive, endeavour; (3) BMI through incorporation and translation of templates across institutional settings.

First, while much research has focused on the emergence of new BMs as organizational endeavors, the business models that individuals (rather than organizations) may develop over the course of their professional development paths have received less attention (e.g., Svejnova et al., 2010). Individual business models are overarching “sets of activities, organizing, and strategic resources that individuals employ to pursue their interests and motivations, and to create and capture value in the process.” (Svejnova et al., 2010: 409) We only have limited knowledge, however, about how individuals that engage in creative and entrepreneurial professions (such as chefs, scientists, inventors, and creators of digital contents among many others) may develop specific business models to monetize their professional activities, and how such business models relate to the career development of these professionals. This may be an important issue, for instance, in light of the profound changes and evolution that work and professions are facing due to the digital transformation, as a consequence of which new autonomous, entrepreneurial jobs are rapidly emerging (Neufeind, O’Reilly, & Ranft, 2018; Schwab, 2017). How do, for instance, emerging careers and occupations may relate to new individual business models? Furthermore, the motivational triggers and interests underpinning the career development of self-employed individuals may differ from those who intend to pursue entrepreneurial activities while working

inside organizations; the activities and stages of development and transformation of individual BMs may be different for hybrid entrepreneurs and full-time entrepreneurs, as well as the mechanisms underpinning “creative response” (Svejenova et al., 2010: 420). The intrapreneurship and hybrid entrepreneurship literature may provide useful insights to investigate these questions. Furthermore, since entrepreneurs’ strong sense of identity sometimes constrains the development of their ideas and ventures (e.g. Grimes, 2018; Zuzul & Tripsas, 2019), such identity may impact the development of their individual business models as well. These issues as well as the processes through which the BMs of entrepreneurial individuals relate to those of the ventures they may develop, however, are still largely untheorized.

Second, while many studies have assumed that environmental and technology changes are critical determinants of BMI, only a few have contradicted this assumption and explored how individuals and managers can systematically ideate novel business models in absence of exogenous change – that is, as proactive rather than reactive endeavors. While Martins et al. (2015) focus on processes of generative cognition, there may be other strategies and mechanisms that entrepreneurs may use to develop novel business models that create, rather than respond to, industry change. Scholars, for instance, have investigated how entrepreneurs can create opportunities for innovation by combining seemingly contrasting institutional logics (Dalpiaz et al., 2016), incorporating resources from diverse cultural repertoires (V. Rindova, Dalpiaz, & Ravasi, 2011), or drawing on cultural resources from the broader societal and institutional context emerging firms are embedded in (Johnson, 2007). While these studies have focused on product or organizational innovations, the insights contained therein may inspire BMI scholars as well. Future research on business model innovation may therefore drive on studies in cultural entrepreneurship (Gehman & Soublière, 2017; Lounsbury, Gehman, & Glynn, 2019) to produce novel insights on proactive – as opposed to reactive – BMI.

Similarly, as Doganova & Eyquem-Renault (2009) emphasize, successful BMs can serve as templates for imitation by latecomer firms. Based on this reasoning, we could assume that

opportunities for BMI can arise from imitation of successful BM templates from the same industry the firm is embedded in, or from other (more or less adjacent) contexts. Firms, therefore, may use and adapt BM templates from other industries or geographical contexts as they seek to introduce novel BMs. Recent research, for instance, has shown that entrepreneurship sometimes happens through the translation of existing organizational templates across geographical boundaries (e.g., Tracey et al., 2018), as entrepreneurs identify opportunities to replicate such templates in other settings. Similar processes may happen across industry boundaries as entrepreneurs seek to introduce novelty through novel BMs, or use BMI to open up new markets (e.g., McDonald & Eisenhardt, 2019). Relatedly, opportunity identification through cross-industry translation or de-novo inventions may have different implications for the overarching design theme (e.g., Amit & Zott, 2001; Zott & Amit, 2007) and innovativeness of the BM being developed. Scholarly investigations on these processes, however, are still rare. Finally, there are many research opportunities to further explore how opportunities for novel BM emerge and are identified by entrepreneurs in contexts other than high-tech industries or the creation of sustainable businesses, on which much of the available research has focused.

The Business Modelling process under uncertainty

Papers in this second set deal with firms' engagement in processes of opportunity enactment and exploitation, focusing on how opportunities are enacted over time, and how business models are designed accordingly to appropriate value from them (George & Bock, 2011). I found two communities generally associated with this matter (community 2 and 4). Albeit adopting slightly different viewpoints (papers in community 2 focus more on delineating the process of BM design and its relation with the firm's organizational form, while community 4 focuses more on the role of uncertainty in this process) this set of studies fundamentally deal with the same overarching theme – that is, the process through which entrepreneurs identify and select a specific course of action, engage in entrepreneurial organizing, and deal with the uncertainty that is inherent in the development of a novel Business Model. This meta-group therefore includes

studies that seek answer to the following research questions: i) *how do new ventures design innovative business models and adjust them as they grow?* ii) *how do established firms transform their business and go from one business to another?* And iii) *how does uncertainty impact on business modelling decision?*

New venture development and business model design. Studies in this first subset are mostly focused on understanding how new ventures design and re-design innovative business models as they grow. They examine the processes of trial-and-error learning and experimentation underlying the development and commercialization of novel ideas, and explain how new firms can successfully bring their innovations to the market through innovative business models.

A first interesting set of studies analyze the processes through which business models are designed and scaled. Dunford, Palmer, & Benveniste (2010: 656), for instance, focus on “the processes whereby emerging ventures become global players” and analyze the development and internationalization process of ING Direct as a global retail bank. They argue that as new firms go global, the exploration of possible business models for each market and the subsequent exploitation of the selected one occurs along a dynamic and ongoing process that involves continuous and iterative modification of the initial business model as firms’ enter in each new country. Similarly, Palo & Tähtinen (2013) shed light on the processes through which new ventures mobilize efforts from different actors involved in the development, testing and commercialization of technology-based services and thus build innovative networked business models that involve multiple companies. Finally, Snihur (2016) focuses on how new ventures can design and execute novel BMs that help them achieve optimal distinctiveness (Zhao, Fisher, Lounsbury, & Miller, 2017).

Others studies examine organizational frameworks and guiding principles that new ventures can apply as they design novel business models. Yunus, Moingeon, & Lehmann-Ortega (2010), for instance, draw on evidence from the development of Grameen Bank as a financial institution offering micro loans to poor people to disentangle five guiding principles that social enterprises can apply while developing business models that incorporate business as well as societal

goals, and that have potential to challenge conventional industry assumptions. In the context of technology-based ventures, other studies offer guidance to new firms on the business model design principles (Onetti, Zucchella, Jones, & McDougall-Covin, 2012), organizational forms (Miles, Miles, Snow, Blomqvist, & Rocha, 2009), methodological tools (Gondal, 2004) and specific behavioural approaches and methods (Trimi & Berbegal-Mirabent, 2012) that these firms can use.

Corporate renewal and business model innovation. This subset includes studies that shed light on the processes and capabilities through which incumbent firms pursue entrepreneurial strategies by innovating their existing business models in order to secure competitive advantage. In this context, business model innovation is conceived as an act of strategic entrepreneurship – i.e., entrepreneurial activity within an established business to simultaneously pursue opportunity- and advantage-seeking behaviours (Hitt, Ireland, Camp, & Sexton, 2001; Ireland, Hitt, & Sirmon, 2003; Ireland & Webb, 2007; Kuratko & Audretsch, 2009; Lampe et al., 2019) – whereby firms modify the architecture (Foss & Saebi, 2018; Teece, 2010) of their value creation, delivery, and appropriation activities in value-creating ways.

Foss & Saebi (2018) provide conceptual grounding for the notion of BMI as modification of the architecture of firms' offering as well as activities to produce, deliver, and appropriate value from it, by arguing that the concept of BM "points to the interconnectedness of those choices that matter (the most) to the performance of the firm" (Foss & Saebi, 2018: 16). They argue that scholars interested in analysing strategic renewal can use BMI as either moderating/mediating, independent, or dependent variable. (Karimi and Walter (2016) analyze BMI in the newspaper industry by testing the relationship between established firms' entrepreneurial orientation (EO) (see Lampe et al., 2019 for a recent review) and adoption of disruptive BMI. They find three dimensions of EO as positively related to BMI adoption: autonomy, risk-taking, and proactiveness, as well as a nonlinear relation between BMI adoption and its performance, with the lowest effect on BMI performance being at intermediate levels of BMI adoption (whereas at either low or high levels of BMI adoption, the impact on its performance is high).

Other scholars have drawn on insights from social entrepreneurship research to shed light on the processes through which firms have modified their extant models to introduce sustainability principles (Alberti & Varon Garrido, 2017; J. Newth, Shepherd, & Woods, 2017; Olofsson, Hoveskog, & Halila, 2018; Schaltegger, Lüdeke-Freund, & Hansen, 2016) or develop innovations to serve marginalized individuals in developing countries (Rosca, Arnold, & Bendul, 2017). Collectively, these studies offer several conceptual frameworks to explain firms' entrepreneurial actions aimed at developing products and businesses that address social and environmental issues. Schaltegger, Lüdeke-Freund, and Hansen (2016), for instance, introduce four pathways through which firms can embrace sustainable BMIs and diffuse them in established markets. Similarly, Alberti and Varon Garrido (2017) study the development of a fundraising organization to examine the challenges of developing hybrid business models and offer recommendations for established firms seeking to renew their businesses by incorporating multiple and apparently conflicting goals. Finally, Newth, Shepherd, and Woods (2017) apply complexity theory to the case of a project lead by a non-profit fundraising organizations in New Zealand to shed light on the threats that path dependencies may pose to firms seeking to renew their BMs in face of changes in environmental and market conditions.

Finally, a smaller group of studies offers practitioner-oriented guidelines for corporate managers to help them develop novel business models in established businesses. Engel (2011), for instance, highlights several lessons that established businesses can learn from Venture Capital investors as they seek to foster corporate innovation through uncertain activities such as BMI, and Rosca, Arnold, and Bendul (2017) analyze 59 cases of frugal and reverse innovation and associated business models that established businesses such as Nokia, Siemens and IKEA have developed to highlight the trajectories along which these innovations can result in successful BMs in both developing and industrialized countries.

Business modelling under uncertainty. A smaller subset of studies focus on the challenges that developing new business models in highly uncertain markets entails for both new

and established firms. Collectively, these studies consider uncertain contexts as markets characterized by high volatility (Dobson, Boone, Andries, & Daou, 2018), scarcity of information about customers (Thompson & MacMillan, 2010), or distant knowledge (Andries et al., 2013).

Thompson & MacMillan (2010: 291), for instance, draw on illustrative evidence from ventures participating in the Wharton Societal Wealth Program to offer a framework to orient entrepreneurial decision making for designing new business models in face of little or no market information – a situation they label as “near Knightian uncertainty”. They argue that, in such settings, entrepreneurs and/or corporate managers’ main task is that of “reducing uncertainty to risk” (Thompson & MacMillan, 2010: 293) by reducing the number of possible options to those that seem plausible, in order to assign a probability distribution to the expected outcomes, and thus make them plannable. They propose several principles that entrepreneurs and managers can use to accomplish this task. Similarly, Dobson et al. (2018) that in highly uncertain and volatile contexts BMs should be designed and scaled simultaneously, following an iterative process of experimentation along which each scaling attempt is treated as an experiment to improve the current BM.

Some studies in this subset explicitly focus on the critical role of experimentation to manage BM design under uncertainty. Andries and colleagues (2013), for instance, propose two alternative approaches that ventures can use to develop novel business models in uncertain conditions: focused commitment (i.e., selection of one specific business model very early on, and commitment to it until initial assumptions fail to materialize and the venture is forced to pivot the business) and simultaneous experimentation (i.e., engagement with a series of related business model experiments organized as configurations of related BMs until a viable one that is also widely accepted by the venture’s key stakeholders emerge). They find that even though simultaneous experimentation may initially hinder ventures from collecting funding as providers of financial resources may be constrained by the fact that a final BM has not been selected, it also leads to uncertainty reduction on several alternatives, and thus facilitates the selection of (the most) viable business model over

time and the venture's success in the long run. Conversely, focused commitment may enhance the initial growth of the venture, but jeopardize its success in the long run. Finally, Bojovic, Genet, & Sabatier (2018) disentangle three interrelated roles of experimentation in the business modelling process: learning about potential markets through experimental projects in real-life settings, signalling the venture's intentions and its potential value and thus increasing its perceived legitimacy, and convincing key stakeholders to embrace the venture's BM.

Assessment and summary

Studies on opportunity enactment and exploitation through business modelling mainly focus on processes of business model design and execution through which new ventures and established firms grow and rejuvenate themselves, as well as on the various way in which uncertainty influences entrepreneurial decision making throughout these processes.

A first subset of studies document the processes and principles through which new firms design novel BM as they grow. Despite analysing this topic from different perspective, these studies generally agree that new ventures' BMI endeavours follow an iterative process of exploration of potential business model alternative, experimentation and feedback from key stakeholders, and iterative adjustment until a path is selected. Such processes are documented mostly in settings such as technology-based ventures (Clausen & Rasmussen, 2013; Flammini, Arcese, Lucchetti, & Mortara, 2017; Gondal, 2004; Lubik & Garnsey, 2016; Onetti et al., 2012; Trimi & Berbegal-Mirabent, 2012) and social enterprises. These studies shed also light on how new ventures can design novel business models through inter-organizational arrangements (Miles et al., 2009; Palo & Tähtinen, 2013), and achieve socio-political and cognitive legitimacy (Ernkvist, 2015; Snihur, 2016) as they seek to disrupt existing industries.

Studies in the corporate renewal subset focus on the organizational capabilities, processes, and challenges associated with incumbent firms' efforts at modifying extant business models. These studies generally agree that BMI is necessary for established firms to keep the pace with technological and environmental evolution, and identify entrepreneurial orientation as the primary

driver of BMI in established firms. These studies offer conceptual grounding to understand what BMI means for incumbents (Foss & Saebi, 2018), and build on different streams of research such as strategic entrepreneurship and social entrepreneurship to shed light on how established firms can successfully respond to the need of renewing extant BMs in settings such high-tech markets (Engel, 2011), and hybrid organizations (Alberti & Varon Garrido, 2017; J. Newth et al., 2017; Olofsson et al., 2018; Schaltegger et al., 2016).

Finally, studies in the business modelling under uncertainty subset highlight the importance of strategies such as simultaneous experimentation and testing with different BM configurations (Andries et al., 2013; Dobson et al., 2018) – that is, different “architectures” for the same value proposition – to manage BM design in highly uncertain settings. They also show that business modelling requires validation of the chosen path from key audiences such as customers and investors (e.g., Andries et al., 2013; Bojovic et al., 2018) and that it is through this dialectic interaction and incorporation of key stakeholders’ feedback that entrepreneurs and managers can have their ideas validated, improved, or abandoned, and signal the BM potential to key audiences.

Emerging research opportunities

Studies in the second subset (communities 2 and 4) have informed scholarly understanding on the processes and mechanisms through which new and established firms enact and exploit opportunities through the design and execution of novel business models. Based on the review findings and assessment, emerging opportunities to extend and inform this conversation include: (1) a clearer distinction between entrepreneurial orientation and corporate entrepreneurship; (2) a growing interest in co-exploration; and (3) the relation between the design of innovative BMs and organizational forms.

First, many studies in this subset assume that an important BMI driver is the capability of established firms to act entrepreneurially (Bouncken, Lehmann, & Fellnhofer, 2016; Karimi & Walter, 2016), conceptualized as either firms’ entrepreneurial orientation (EO) (Bouncken et al., 2016) or corporate entrepreneurship (CE) (Karimi & Walter, 2016). Despite these two constructs

are often conceptualized as based on the same attributes (i.e., autonomy, risk-taking, proactiveness, and innovativeness) and used interchangeably, EO and CE are nonetheless distinct concepts (Lampe et al., 2019). While entrepreneurial orientation “refers to an attribute of entrepreneurial organizations”, corporate entrepreneurship refers instead to the pursuit of specific “activities within the organization” (Lampe et al., 2019: 6) – such as, for instance, corporate venturing or strategic renewal (Sharma & Chrisman, 1999). This suggests that they may be related to BMI in different – and largely unexplored – ways. For instance, entrepreneurial orientation may lead to corporate entrepreneurship activities as part of the BMI efforts of incumbent organizations. BMI, therefore, may be a mediator between EO and CE; similarly, the magnitude of such relations may vary based on different BM design themes (e.g., Amit & Zott, 2001; Zott & Amit, 2007). For instance, while EO may drive novelty-oriented BM designs which in turn may foster strategic renewal or the emergence of new ventures inside corporations (i.e., CE), the same may not happen from BM transformations aimed at enhancing efficiency. Based on the review conducted for this study, while some have considered BMI as a mediating variable (e.g., Fütterer et al., 2017), available literature has not investigated these possible patterns.

Second, while the majority of the studies included in this review investigate BMI as an endeavour of individual organizations, whose underlying capabilities (such as entrepreneurial orientation) are nurtured and developed inside firms, some suggest the importance of engaging with others in such processes instead. For instance, Palo & Tähtinen (2013) investigate the emergence of networked business models, Miles et al. (2009) suggest the Innovation Form as suitable to engage in co-exploration, and Foss & Saebi (2017) suggest that open innovation may be an important driver of BMI that requires further investigation. Building on research on open business models (Chesbrough, 2006; Holm, Günzel, & Ulhøi, 2013) as well as on research on the relational sources of entrepreneurial capabilities (Dubini & Aldrich, 1991; Giudici et al., 2018; Teece, 2012), future research could examine the extent to which firms’ capabilities to innovate existing BMs reside inside the firm or are developed through collaboration with others. Several

organizations exist to support firms explore innovation opportunities and forge relations with other organizations, such as venture associations (Giudici et al., 2018), bridging organizations (Bessant & Rush, 1995; Sapsed, Grantham, & DeFillippi, 2007), and business accelerators (Cohen et al., 2018; Kohler, 2016; Shankar & Shepherd, 2018). Collaborating with such organizations and exploring innovation opportunities with them may, in turn, have an impact of the BM of the firm. These organizations may help firms sense particular opportunities (Teece, 2012), or contribute to firms BMI strategies by fostering activities such as corporate venturing (Chesbrough & Rosenbloom, 2002) or corporate accelerators (Shankar & Shepherd, 2018). Similarly, collaborations with these organizations may lead to new ecosystem-based business models. Research on these emerging relational dynamics and their impact on firms' BMs and underlying entrepreneurial capabilities is, however, largely underdeveloped.

Furthermore, researchers are increasingly interested in the impact of organizational sponsors such as accelerators (Cohen et al., 2018; Drori & Wright, 2018) on new ventures development. Building on these insights, future studies could investigate how newly born organizations that take part in acceleration program build and develop their business models, and what is the impact of these supporting organizations on the decision-making processes of entrepreneurs throughout this process. The highly structured design (Cohen et al., 2018) and educational component inherent in accelerators (Cohen & Hochberg, 2014) may lead entrepreneurs to rely on certain business model development logics (e.g., Reymen et al., 2017) – for instance, favoring causation over effectuation, or vice versa – or have different impacts on the underlying design theme of the BM being developed which, in turn, may impact new ventures performance differently. While being accelerated, startups may decide to pivot their business, which in turn leads to changes in the BM being developed. Relatedly, empirical evidence shows that many accelerators are themselves innovating their business models from accelerating startups to accelerating corporate innovation, or migrating towards various “corporate as a client” models (see,

e.g., http://gust.com/accelerator_reports/2016/global/). Available research, however, has remained substantially silent on these new emerging phenomena.

Another interesting research avenue that the results of this review suggest is the relationship between business model design and innovation and organizational forms. Although I found only one study explicitly concerned with the important role of choosing an appropriate form to pursue BMI (Miles et al., 2009), the emergence and change of new and established organizational forms may nonetheless be related to BMs and BMI in several ways. First, as organizational forms “broadly capture the character of an organization's structure, function and process” (McKelvey, 1982: 107) by encompassing the “characteristics of an organization that identify it as a distinct entity and, at the same time, classify it as a member of a group of similar organizations” (Romanelli, 1991: 82), different business models may exist that correspond to a single organizational form. Similarly, firms may engage in entrepreneurial endeavours aimed at shaping the emergence of new forms as they come up with new business models. Second, as organizational forms morph (Rindova & Kotha, 2001) to match the dynamic evolution of the firm’s environment, such morphing processes could lead firms to innovate the underlying business models as well. Third, as scholars have argued that business models can be entrepreneurially innovated by drawing on elements from different conceptual domains (Martins et al., 2015), similar processes may happen as both new and established firms develop innovative business models by drawing on the attributes of different organizational forms, thus engaging in organizational bricolage (Perkmann & Spicer, 2014). Finally, as organizational forms include firms identity codes (Hsu & Hannan, 2005) as perceived by external audiences, scholars could examine how the BM being developed by firms corresponding to certain organizational forms relate to firms’ identities, and how entrepreneurial identities, in turn, shape the choices and activities process of BM evolution (e.g., Snihur, 2016). For instance, some studies in this subset argue that firms pursue multiple business models at the same time (Clausen & Rasmussen, 2013) despite being generally associated with the same form (e.g., the Research-Based Spin-Off). Do parallel business models entail the existence of multiple or hybrid identities within

firms? How are processes of BM development and entrepreneurial identity construction related in entrepreneurial firms? Do firms converge to similar business model designs as they shape the emergence of collective identities? Does this have implications for the ways external audiences perceive and interpret innovative business models (Mikhalkina & Cabantous, 2015) and, in turn, for firms' survival and growth? And how does identity facilitate or hinder BMI in established firms? Researchers employing both longitudinal and cross-sectional designs could answer these questions and enrich our understanding of the processes and capabilities through which firms enact and exploit opportunities through the design of novel business models.

The role of contexts and resources on entrepreneurial business modelling

As scholars have emphasized, entrepreneurial endeavours are embedded in specific contexts (Welter, 2011), which “simultaneously provides individuals with entrepreneurial opportunities and sets boundaries for their actions” (Welter, 2011: 165). Understanding what these contexts are, and what is their role in shaping entrepreneurial endeavours through which new business models come about is, therefore, important to better understand “when, how, and why entrepreneurship happens and who becomes involved.” (Welter, 2011: 166). Studies in this last set (group 3) contribute to this conversation. I found three overarching research questions related to this debate: i) *in which resource contexts do entrepreneurs identify and exploit opportunities for BMI, and how do they acquire and combine the required inputs?* ii) *how do specific markets and institutional contexts shape entrepreneurial action related to the emergence of novel BMs?* And iii) *what is the role of intra-firm factors (i.e., specific capabilities or organizational contexts) in enabling or hindering the emergence and adoption of new BMs?*

BMI and resource acquisition. Studies in this first subset inform our understanding of the resource contexts in which novel BMs emerge and are successfully executed – that is, the “the different environments in which entrepreneurial actors acquire and allocate inputs necessary for the exploitation of a potential opportunity” (Shepherd et al., 2019: 178) – focusing on the strategies and processes through which entrepreneurs both relate to and shape the context they are embedded in. More specifically, they focus on how entrepreneurs collect, mobilize, and combine the physical

(Halme, Lindeman, & Linna, 2012; Holzmann, Breitenecker, Soomro, & Schwarz, 2017; Mangematin et al., 2003; Najmaei, 2016; Papagiannidis & Li, 2005) and sociocultural (Doganova & Eyquem-Renault, 2009; Witkamp, Raven, & Royakkers, 2011) resources that novel BMs require. According to these studies, BMs are performative devices (Perkmann & Spicer, 2010) that guide entrepreneurial actions and decisions about which resources are needed and how they may best be combined.

Studies concerned with the acquisition of physical resources generally drive on the resource-based view of the firm and are concerned with the processes through which entrepreneurs running new ventures or innovative projects within corporations determine which resources they need as they develop novel BMs, and what is the role of such resources in determining which BMs gain success in the market. Mangematin et al. (2003), for instance, investigate the diverse BM underlying the development of biotech SMEs in France and use them as classification devices to categorize different types of firms. The different BMs being developed, in turn, shape decisions as for which resources are needed, in which amount, and from which sources (e.g., by developing them internally or in partnership with other firms), and can be used to predict which cooperative or competitive dynamics are likely to emerge in the industry. Similarly, Najmaei (2016) argues that new business models are developed along with the novel configurations of resources they require, which are then used to organize the business around specific activities, and orchestrated into the capabilities to deliver value to key stakeholders and convert revenues into profits.

Differently from these studies, Halme et al. (2012) focus instead on how intrapreneurs collect and combine the resources they need to develop novel business models aimed at serving new markets within well-established corporations. They focus on the processes through which intrapreneurial “bricoleurs” (Halme et al., 2012: 746) develop novel business models to serve low-income markets, and use the notion of intrapreneurial bricolage to conceptualize “entrepreneurial activity taking place in large organizations in contexts of resource scarcity and characterized by creative bundling of resources at hand.” (Halme et al., 2012: 747). Using cases of innovative

projects from Nokia and ABB, they find that middle managers may use intrapreneurial bricolage strategies to promote new (pro-poor, in this case) business models despite the several obstacles that may prevent their firms from accepting such, circumvent and overcome such constraints, mobilize both internal and external resources, and push innovations forward to turn ideas into viable BMs.

An emerging stream of studies focuses on the acquisition of sociocultural resources, and puts greater emphasis either on how business models can be used to legitimize emerging ventures or on agentic, strategic efforts by entrepreneurs (especially in the social entrepreneurship domain) to gather resources for novel business models that challenge institutionalized industry norms. For instance, Doganova & Eyquem-Renault (2009) analyze the different roles that business models play in the development and legitimation of new technology-based ventures (namely demonstrations, scale models, and templates). They argue that BMs can be used as storytelling devices (e.g., Garud et al., 2014) through which entrepreneur depict the business in different ways to fit with the cognitive schemas of different audiences (Fisher, Kuratko, Bloodgood, & Hornsby, 2017), and thus narratively plot the venture to make it understandable for them. In the early stages of business development (overflowing phase), emerging BMs are influenced and shaped by the context they are embedded in as they develop, and are continually adjusted (along with the narratives associated with them) as entrepreneurs receive and interpret feedback from key stakeholders. When a business model is selected and gains success in the market, prospective entrepreneurs then may use it as a template for imitation. Finally, Witkamp et al. (2011) argue that entrepreneurs developing BM that challenge institutionalized industry norms (such as novel social entrepreneurship models) should first seek to establish a market niche in which they can experiment, learn, and acquire legitimacy from other actors with aligned expectations. Such niches thus serve as micro-markets that provide ventures with access to the necessary resources for experimentation and temporarily protect them from mainstream markets.

Business modelling in context. A second interesting subset of studies focuses on the role of specific institutional contexts or markets in shaping the entrepreneurial actions that lead to the emergence of novel business models for both new and established firms. These studies shed light on how novel business models emerge to serve the needs of people in specific regions of the world such as, for instance, developing countries or emerging economies (Javalgi, Todd, Johnston, & Granot, 2012; Sanchez & Ricart, 2010; Seelos & Mair, 2005) as a result of changes in existing markets (C. Richter, Kraus, Brem, Durst, & Giselbrecht, 2017), as well as on how entrepreneurial actions in the development process of novel BMs are shaped by the influence of diverse stakeholders (Jamie Newth, 2016), market imperfections (Cohen & Winn, 2007), and different local contexts (Autio, 2017).

Some studies show how processes of BM design and development emerge as a result of the interaction between the entrepreneur and other actors. Newth (2016), for instance, explores how the business model of a nascent social enterprise in New Zealand was developed as a result of an ongoing interaction between the vision of the founding entrepreneur and the multiple stakeholders populating its external environment. He argues that stakeholders such as initial volunteers and customers, institutional infrastructures and regulatory constraints, institutional discourses about the issues the venture addresses, as well as prominent partners such as large NGOs can shape the development process of a social enterprise's business model through the resources they do (or do not) provide to it. As they grow, new ventures secure resources from multiple stakeholders through contestation with them, whose salience changes over time and as a result of the changing norms and institutions governing its environment. In a similar vein, some papers shed light on how large businesses can develop new corporate social entrepreneurship models by accommodating and reconciling the interests of multiple actors (D'Angelo, Brunstein, & Mainardes, 2015), empowering marginalized individuals (Ras & Vermeulen, 2012), and exploiting the collaborative opportunities arising from the sharing economy (Richter et al., 2017).

Others studies explicitly focus on how markets provide inputs for the emergence and development of novel business models. On these regards, Cohen & Winn (2007) argue that opportunities for novel BMs can arise from imperfections in existing markets and that entrepreneurs that are able to identify and exploit them can appropriate significant rents. Autio (2017) focuses instead on the internationalization process of new ventures, arguing that the different markets in which entrepreneurs seek to enter as they scale their business can be used by entrepreneurs as experiments to test the hypothesis on which their business model is constructed, validate them, and modify their BM accordingly.

Finally, some studies focus on how developing economies can serve as context offering opportunities to existing firms, but also as challenging landscapes for which firms have to adapt their BM development processes. Sanchez and Ricart (2010), for instance, explore how context-related factors such as resource munificence and environmental dynamism (i.e., predictability of a given environment) interact with organizational resources and capabilities to shape business model decisions as firms seek to enter low-income markets, and to what extent firms need to forge inter-organizational relationships to access these markets by creating ecosystems of external partners. They find that isolated business models (aimed at exploiting existing opportunities through current resources and capabilities) are effective in contexts with abundant resources and low levels of dynamism, in which firms can simply replicate their existing BM in a new context and foresee the consequences of their BM choices. Conversely, interactive BMs (aimed at creating new opportunities through integration of the firms' resources and capabilities with those of external partners and local actors) are effective in contexts in which the resources needed to replicate the firm's current BMs are not available and environmental predictability is low. Similarly, Seelos & Mair (2005) argue that opportunities for new business models may arise from the basic, unmet needs of people living in developing countries (such as food or medicines), which are willing (but not able) to pay for products and services that meet those needs, as opposed to people living in wealthy economies that are able (but not necessarily willing) to pay for them.

Intra-firm influences on business modelling. Studies in this last subset focus on intra-organizational contexts and factors (i.e., management practices or specific organizational capabilities) that may impact the emergence and development of novel business models and the underlying entrepreneurial actions. Schindehutte, Morris, and Kocak (2008) argue that their entrepreneurial capital drives the ability of firms to revolutionize existing markets and create new ones – that is, the “human and social capital that together enable company leaders to envision the future, recognize opportunity, develop novel business models, pursue and mitigate risks, leverage and combine unique resource bundles, and demonstrate tenacity in exploiting a given opportunity” (Schindehutte et al., 2008: 11). Differences in firms’ entrepreneurial capital explain why some companies are able to develop unique value combinations (i.e., business models) that create markets that did not exist before and disrupt existing ones, as well as why some firms are able to shape the evolution of their markets rather than being shaped by them.

Some studies build on this argument to investigate the individual-level determinants of entrepreneurial capital. Najmaei (2015), for instance, argues that managers' attitude towards exploring new business models associated with flexibility, change, and innovation is driven by their stock of firm-specific technological knowledge; Chakravarthy & Lorange (2008) likewise state that managers with strong entrepreneurial orientation and that are capable of ideating and executing new BMs are generally self-confident, risk-taking and action-oriented, and Stieglitz and Foss (2009) develop arguments in favour of a judgment-based view of entrepreneurship according to which processes of opportunity search and design of novel business models are driven by entrepreneurs' expectations about the value-creating potential of each option, as well as about its value appropriation potential.

Others are concerned with the development of entrepreneurial capital at the organizational level. These studies are aimed at developing theoretical frameworks that explain why some firms are better than others in embracing BMI (Vlaar, De Vries, & Willenborg, 2005), which organizational practices can be found in firms that successfully adopted innovative BMs (Ishii et

al., 2014), as well as which capabilities are associated with established firms' entrepreneurial activities aimed at pursuing BMI (Mütterlein & Kunz, 2017; Roaldsen, 2014). These studies argue that firms' ability to embrace new business models is driven by the extent to which they grant high degree of decision-making autonomy to organizational members (Ishii et al., 2014; Mütterlein & Kunz, 2017), their ability to embrace risk-taking, proactive, and aggressive approaches to competition (Mütterlein & Kunz, 2017), and the presence of organizational routines that promote cooperation among a diverse management team, collective learning, strategic resource allocation aimed at updating operational processes, and trust (Roaldsen, 2014). Conversely, entrepreneurial orientation is hampered by firms' tendency to act upon conventional wisdom, take decisions on the basis of incompetence (i.e., lack of information) or overconfidence (i.e., deliberate choice to pursue a different path), and avoid embracing full-scale exploration (Vlaar, 2005).

Assessment and summary

Studies focused on exogenous and endogenous influences on entrepreneurial business models focus on the processes through which entrepreneurs gain the physical and sociocultural resources needed to develop innovative BMs, as well as on the role of specific contexts (such as regional, institutional, or organizational) in enabling or constraining such processes.

Studies in the resource acquisition subset drive on conceptualizations of the BM as cognitive (George & Bock, 2011) and performative (Perkmann & Spicer, 2010) device that orient entrepreneurial action, according to which entrepreneurs explain the business to key stakeholders and take the resource acquisition and management actions that are necessary to run it (Spieth et al., 2014). They show that novel business models are developed as ongoing negotiation processes between entrepreneurs and the key stakeholders they want to address (both external and internal to the firm), whose relevance varies over time and according to the unique configuration of resources the firm seeks to pursue. As they receive feedback from key stakeholders, entrepreneurs adjust and refine such resource configuration, canalize them in different key capabilities, and seek to establish relations with other actors. The different business models that emerge from these

processes, in turn, shape the current and future composition of different industries. BMs thus serve as classification devices of the various firms that populate a given industry, as well as rationales to explain inter-firm competition for the same resources and the formation of inter-organizational relations. As they are perceived as value-creating configurations, BMs also serve as templates that future entrepreneurs can imitate.

Studies within the business modelling in context subset focus on the role of institutional, technological, and market context on the emergence, initiation, and exploitation of entrepreneurial endeavours aimed at developing innovative business models. Collectively, they shed light on how opportunities for new BMs emerge as a results of imperfections in existing markets (Cohen & Winn, 2007), societal and humanitarian needs that are still unmet (Ras & Vermeulen, 2012; Seelos & Mair, 2005), and new models of consumption (Richer et al., 2017). As firms identify and seek to exploit opportunities for the creation of innovative business models, specific characteristics of the context in which such endeavours are situated (such as, for instance, institutional complexity, resource availability, and market predictability) shape entrepreneurial decisions as for how to approach BM development with respect to its degree of exploration (e.g., Sanchez & Ricart, 2010) and decision-making approach (Autio, 2017; Javalgi et al., 2012). Finally, since new business models require the mobilization of resources from multiple audiences, entrepreneurs need to modify, adjust, and refine their models in order to accommodate and incorporate the interests of key stakeholders and engage them with the venture as they grow (D'Angelo et al., 2015; Jamie Newth, 2016).

Finally, studies concerned with intra-firm influences on business modelling focus on the managerial and organizational drivers of firms' entrepreneurial orientation which, in turn, enables firms to identify, enact, and exploit opportunities for creating new business models that revolutionize existing markets or create new ones (Schindehutte et al., 2008). They investigate the individual and organizational foundations of entrepreneurial orientation, focusing on the role of specific attitudes, characteristics, or expectations of entrepreneurs or corporate managers that lead

them to take actions oriented at enacting entrepreneurial strategies (Chakravarthy & Lorange, 2008; Najmaei, 2015; Stieglitz & Foss, 2009), as well as on the organizational capabilities, practices and routines that may facilitate or hinder them (Ishii et al., 2014; Mütterlein & Kunz, 2017; Roaldsen, 2014; Vlaar et al., 2005).

Emerging research opportunities

Studies in the third subset (community 3) contribute to scholarly understanding on the various ways in which full-time entrepreneurs and hybrid entrepreneurs working inside corporations gather and combine the resources needed to develop novel business models, the relation between the BM being developed and the resource acquisition decisions being made, and the various ways internal and external contexts influence business modelling decisions. Several opportunities exist to enrich and contribute to this conversation, including: (1) a more in-depth investigation of the internal (intra-firm) drivers of BMI; and (2) a more comprehensive view of the social evaluation pressures firms face as they develop novel business models for growth.

First, studies that investigate the impact of intra-firm contexts on BMI are comparatively less developed than the other subsets and mostly focused on the role of entrepreneurial capital and entrepreneurial orientation. However, many other factors may play a role in driving or hindering BMI in both established and newly born organizations. In the context of established firms, for instance, past research has found that incumbent firms react to business model innovations differently depending on whether these are cognitively perceived as opportunities or threats (Dewald & Bowen, 2010). Perceptions of decision-makers, in turn, may spread to other levels in organizational hierarchies through processes of internal framing, thus fostering enthusiasm or resistance towards BMI, which may ultimately influence the success of such initiatives. As Halme et al. (2012) argue, indeed, tolerance of organizational members is essential for the pursuit of novel BMs inside organizations. Similarly, in the context of new firms scholars have argued that, starting from the same invention, entrepreneurs choose different opportunity exploitation paths based on their prior knowledge of particular markets, ways to serve such markets, and specific customer

problems (Shane, 2000), as well as on processes of structural alignment (i.e. resemblance and comparison) with what is already known to them (Grégoire, Barr, & Shepherd, 2010). As business models are critical opportunity exploitation devices (George & Bock, 2011), future research could drive on these insights to enrich our knowledge of how both entrepreneurial and managerial cognition drive or hinder BMI initiation, as well as organizational reactions to novel BMs being introduced in existing industries (Dewald & Bowen, 2010), in both new and established firms. How do, for instance, prior entrepreneurial experience relate to BM design choices and resource acquisition decisions, and does it have implications for the innovativeness of the BM being developed? Do these effects differ in solo-funded ventures or ventures that are founded by teams, or in ventures that are founded by serial rather than first-time entrepreneurs?

Relatedly, recent research has shed light on the critical role the new ventures' founders play in the BM development process of nascent firms. For instance, Zuzul and Tripsas (2019) have found that founders who see themselves as being 'revolutionary' entrepreneurs come up with more novel ideas for the BM of their firms, but may nonetheless refuse to adapt it over time in ways that would make it "less radical" (Zuzul & Tripsas, 2019: 19), and thus be trapped by inertial behaviours. Similarly, Snihur & Zott (2019) have argued that entrepreneurs can develop novel imprints that lead some ventures to develop innovative business models through specific practices related to their search (industry-spanning vs industry-focused), thinking (complex system vs internal efficiency), and decision-making styles (powerful centralized vs organic decentralized). Systematic explanations of how founders' attributes such as identities, imprints, personality traits, and specific capabilities impact the innovativeness of the BM being developed, and which are the implications for their ventures, however, is still scarce. Similarly, since scholars have argued that entrepreneurs that are both owners and managers of firms have an important role in BM design (Velu & Jacob, 2014), what happens to the BM of the firms during and after periods of founder-CEO successions? And do these dynamics differ in family-owned versus non-family businesses?

Another internal factor that may relate to BMI adoption (or resistance) may be

organizational culture. Are there any cultures that facilitate or hinder BMI? And are entrepreneurial cultures systematically related to BMI adoption? How can we best empirically measure and capture these relations? Moreover, many large incumbents nowadays develop innovative ideas (that may potentially become parallel business models) through internal innovation contests and call for ideas related to, for instance, new technologies or products being developed. To what extent do these ideas effectively translate to the initiation of novel business models within enterprises? And how can the pursuit of BMI from organizational members ideas be encouraged within enterprises? Is there any framing or rhetorical strategies that business model innovators can use to this purpose?

Second, studies that examine the relational dynamics between the BM of the firm and the environment it is embedded in have primarily emphasized the importance of narratively plotting the BM in such a way that external audiences can understand it and grant support to the venture (e.g., Doganova & Eyquem-Renault, 2009). While these insights are important to articulate the legitimation challenges faced by novel enterprises as they design and adjust their BMs over time, whose effective management is an essential determinant of their survival (Delmar & Shane, 2004) and growth (Zimmerman & Zeitz, 2002), available literature has remained relatively silent when it comes to considering other social pressures that both new and established firms may face as they seek to introduce novel business models in existing firms or industries. First, external legitimacy pressures may lead new ventures to pivot, which entails radically change their initial business models. As they pivot, however, ventures may, in turn, face new challenges related to, for instance, internal legitimacy (Drori & Honig, 2013) or stakeholders' organizational identification (Hampel, Tracey, & Weber, 2019). How do these potentially recursive cycles of inter- and intra-social evaluation challenges relate to business model design and development choices? And how do social evaluation challenges look like as entrepreneurs transition from developing and seeking audiences' support for novel products (Hargadon & Douglas, 2001) to novel business models? Are there any stigmatized business models? And can stigmatizing events lead to BMI decisions for both new and established firms? And if stigmatized BMs exist, do firms pursuing them enact specific strategies

to gain legitimacy nonetheless and potentially move from stigma to legitimacy (Hampel & Tracey, 2017)? Finally, innovation champions inside firms can also face resistance from organizational members when trying to push novel ideas or promote a change in the BM of the firm. Driving on research on narratives, framing, and rhetorical strategies, it would be interesting to investigate how entrepreneurial managers legitimize and seek internal support for BMI decisions.

DISCUSSION

This paper started from two widely discussed, yet poorly investigated, questions: *(i) what have we learned from research at the intersection between entrepreneurship and business model innovation?* And *(ii) which directions are emerging for research going forward?* To answer these questions, I conducted a study on 102 papers on entrepreneurship and BMI published between 2003 and 2018. To understand the theoretical roots of this conversation and analyze similarities among the selected papers, I first computed a bibliographic coupling network (Kessler, 1963; Zupic and Čater 2015) of their references. This analysis showed a dense network of papers citing very similar sources (Figure 2), drawing on a cohesive knowledge base. To uncover the topics that dominate this conversation, I then partitioned the network in meaningful research groups using the Louvain-community finder algorithm (Blondel et al. 2008). Finally, I made sense of the insights provided by studies in each group using meta-synthesis (e.g., Jensen & Allen, 1996; Hoon, 2013), a theory-building method for extracting and synthesizing information from exploratory, qualitative studies. I uncovered three main sets of studies whose insights inform scholarly understanding of, namely, the ideation of novel Business Models, the business modelling process under uncertainty, and the role of contexts and resources on entrepreneurial business modelling. These three groups have sought to answer three main research questions that relate to dominant themes in entrepreneurship research: *(1) How do individuals and/or firms create and/or identify opportunities for new business models?* *(2) How do new and established firms enact opportunities and design viable business models to exploit them, and how does uncertainty impact on this process and underlying decisions?* And *(3) how do firms acquire and combine the resources required to design and execute new business models, and what is the role of markets and intra-firm contexts in these processes?*

Studies answering to the first question (group 1, community 1) focus on the triggers that lead entrepreneurs and managers to create or identify opportunities for innovating existing business models at the organizational- and industry-level, and shed light on the importance of scanning the environment and frame opportunities in business model terms in order to assess opportunity landscape and evaluate their value creation potential. Studies answering to the second question (group 2, communities 2 and 4) focus on the processes and guiding principles through which firms design new business models to enact and exploit value-creating opportunities, and on the role of uncertainty in enabling or constraining entrepreneurial judgment. Collectively, these studies point at the challenges that new ventures face as they design and execute novel business models, as well as the processes underlying such endeavours. They also emphasize the capabilities required to established firms to pursue entrepreneurial strategies aimed at the pursuit of BMI and point at the importance of experimentation with multiple resource configurations and trial-and-error learning to manage BMI processes under uncertainty. Finally, studies answering to the third question (group 3, community 3) focus on the strategies through which entrepreneurs gain and mobilize the resources they need to develop such new models, and on the role that exogenous and endogenous factors play in these processes. These studies shed light on the importance of BMs as devices to categorize different firms and define which particular resources they need, and as storytelling tools to narratively plot the business and negotiate its legitimacy with multiple stakeholders. They also shed light on the role of institutional and organizational contexts in the ideation, validation, and execution of innovative business models. Table 5 summarizes these three research groups and provides exemplary references. I found that studies across these sets have focused on nine areas: (1) opportunity identification and new business models ideation; (2) opportunity identification through business model thinking; (3) frameworks and tools to support business model thinking and opportunity identification; (4) new ventures development and business model design; (5) corporate renewal and business model transformation; (6) business modelling under uncertainty; (7) business model innovation and resource acquisition; (8) business modelling in context; and (9)

intra-firm influences on business modelling. Additional material on specific research questions and representative papers included in each of the nine subsets is provided in Appendix 1, 2, and 3.

Starting from evidence from the review, I finally suggest several areas for future research related to the emerging topics, including: (1) opportunity identification and individual business models; (2) BM ideation as a proactive, rather than reactive, endeavour; (3) BMI through incorporation and translation of templates across settings; (4) a more inclusive set of relationships between entrepreneurial orientation and corporate entrepreneurship in BMI; (5) a growing interest in co-exploration; and (6) the relation between the design of innovative BMs and organizational forms; (7) a deeper investigation of the internal (intra-firm) drivers of BMI; and (8) a more comprehensive view of the social evaluation pressures faced by new and established firms as they pursue BMI. Altogether, these research avenues can stimulate future research by providing a multi-disciplinary agenda for research at the intersection of entrepreneurship and BMI, theoretically grounded in insights from studies within these domains but also in other disciplines such as organization theory and strategic management.

Implications for research on Business Model Innovation

BMI is a widely discussed research topic. Various literature reviews have been published in the last decade, whose contributions have been extremely valuable for scholars in this field to define the conceptual boundaries of what BMI means, as well as what are its drivers, process, and associated outcomes (e.g., Schneider & Spieth, 2013; Foss & Saebi, 2017), and provide an agenda for future research. Collectively, these studies have largely pointed at the importance of adopting an entrepreneurial lens to better understand the triggers, processes, and outcomes of BMI for both new and established firms, and have called for more research at this crossroad. In response to this call, this study provides a thematic map of the research questions underlying scholarly conversations about new business models and entrepreneurship, a so far largely overlooked issue (Foss & Saebi, 2017: 220).

Similarly to what entrepreneurship scholars have argued (e.g., George & Bock, 2011; Trimi & Bergebal-Mirabent, 2011), I also found that business models are important for entrepreneurship as they provide a cognitive and performative basis (e.g., Doganova & Eyquem-Renault, 2009; Perkmann & Spicer, 2010) on which opportunities are identified, framed, assessed, enacted, and exploited by turning them into profitable businesses. Differently from previous studies, however, I did not focus on the static concept of business model as a snapshot of the business, but on its dynamic transformation (be it the transformation of a specific firm's BM, or of the dominant model adopted by firms in a specific industry) to create or respond to contextual changes (i.e., markets, competitive, or technological evolution). Overall, the findings from this study indicate that BMI is an “ongoing journey” (Garud, Gehman, & Tharchen, 2018: 502) along which individual entrepreneurs and entrepreneurial organizations (i) identify and envision opportunities to change the status quo within existing industries or organizational models by cognitively representing them as unique combinations of resources and activities; (ii) enact opportunities and experiment with multiple configurations as they engage in ongoing relationships and negotiations with multiple audiences; (iii) pivot and fine-tune the business as they gain resources from such audiences; and (iv) eventually exploit opportunities by selecting the unique configuration of resources holding the highest value creation potential, in relation to the entrepreneurs' vision as well as what is deemed valuable by the multiple audiences with whom the firm interacts.

Such processual view on BMI from an entrepreneurial lens shifts the focus of attention from who does BMI (that is, the traditional distinction between new ventures introducing novel BM in existing industries, or entrepreneurial organizations modifying existing BM by adding new ones or changing their existing configurations) to what BMI entails – that is, ideating, fine-tuning, and selecting novel and unique configurations of resources and activities in relation with the context in which such entrepreneurial actions are embedded in, and based on entrepreneurial assessment of their value creation potential. Research on BMI can thus draw on a conceptualization of entrepreneurship as ability to recognize profit opportunities and to exercise judgment in

uncertain conditions (Klein, 2008) as well as on studies considering entrepreneurship in terms of its “inherent processual character” (Steyaert, 2007: 453) ultimately aimed at “the creation of newness” (Rindova et al., 2009: 478; Sharma & Chrisman, 1999) to conceive BMI as a contextually embedded phenomenon, whose roots lie in the identification, enactment, and exploitation of valuable opportunities through unique configurations of resources and activities, no matter whether these are originated by the need to overcome environmental change or to rather create it.

In summary, this review complements existing studies by disentangling how entrepreneurship research on opportunity identification, enactment, and exploitation has informed scholarly understanding of the enablers, processes and elements, as well as effects of firms’ pursuit of business model innovation. Such mapping may provide a guide for scholars to analyse the emergence and development of innovative business model from an entrepreneurial lens, assess and take stock of the state of knowledge within this domain, and identify avenues to contribute to the literature.

Implications for research on entrepreneurship

This review provides a comprehensive, analytical account of available research on entrepreneurial endeavours aimed at the ideation, design, execution and adjustment of innovative business models, a task of growing importance for both new (e.g., Zott & Amit, 2007) as well as established firms (e.g., Amit & Zott, 2015; Cucculelli & Bettinelli, 2015; Karimi & Walter, 2016; Kim & Min, 2015). This study complements previous research on the importance of business models for entrepreneurship research (e.g., George & Bock, 2011), and integrates this conversation by emphasizing the links between BMI and processes of opportunity identification, enactment, and exploitation. By contributing to many of the pieces that constitute the overarching puzzle (Shepherd et al., 2019: 160) of entrepreneurship research, therefore, studies on the ideation, development, and contextualization of novel business models are a promising line of inquiry for improving understanding of entrepreneurial organizing broadly conceived.

By considering how entrepreneurs ideate and develop new BMs over time and as contextually situated endeavours, the studies included in this review shed light on how opportunities are identified and envisioned at multiple stages of the entrepreneurial process, and not just before it begins. In this context, exploitation of opportunities assumes a variety of meanings: entrepreneurs, for instance, ‘exploit’ opportunities when they frame opportunities in BM terms (i.e., as misfits between the state of a given industry and the BMs that are currently on the market), when they experiment with different configurations of activities and resources, and when they get feedback from stakeholders. Throughout this ongoing fine-tuning process, the opportunity identified at the beginning of the entrepreneurial journey may even become gradually less relevant as new opportunities arise and are relationally created along the way. Second, by shedding light on how novel BMs emerge and are relationally constructed with multiple stakeholders, as well as on how some novel BMI are designed by networks of collaborating organizations and are shaped by collective rather than individual decisions, findings from these studies inform research on how opportunity enactment decisions are influenced by others and incorporate feedback from the external environment besides the vision of the individual entrepreneur. Third, the results of this review indicate that studies of entrepreneurial business modelling have placed much emphasis on the contextual factors that shape entrepreneurial decision-making, both as features of the external environment in which entrepreneurial endeavours take place (e.g., its degree of turbulence, uncertainty, or geographical scope) as well as socio-cultural dynamics (such as, for instance, the presence of multiple stakeholders with divergent interests, or of audiences to whom the novel BM must appear legitimate). These findings and the future research avenues stemming from it resonate well with recent quest from scholars to include organizational and institutional dynamics in the study of entrepreneurship (Foss, Klein, & Bjørnskov, 2018; Lounsbury et al., 2019; Welter, 2011), and can thus of interested for scholars interested in understanding how entrepreneurship takes place in specific institutional, regional, or cultural context, as well as how these different context enable or constrain entrepreneurial endeavours.

CONCLUSION

In this paper, I reviewed the available literature at the intersection of entrepreneurship and business model innovation research. I combined quantitative bibliometric analyses with qualitative meta-synthesis and identified three main research communities and nine sub-themes on which scholars have focused. I assessed and synthesized the research questions, focus, empirical settings and findings from research in each stream, and provided an integrative framework and reframing of BMI from an entrepreneurial lens that integrates existing scholarly discussion on the link between firms' pursuit of BMI and processes of opportunity identification, enactment, and exploitation, and overcomes definitional issues in BMI research, offering a basis on which future research can advance in a more cumulative fashion. I then turned to offer a multi-disciplinary agenda for future research that draws on these streams and aims at enriching this conversation, providing new directions for theoretical and empirical research at this crossroad. Scholars have largely called for more research addressing the link between BMI and entrepreneurship, arguing that advancing this conversation would yield opportunities for new and insightful studies, for which this review may serve as a starting point. Scholars within both domains can use this review to more easily assess the research topics covered by the available literature, and draw on these findings to identify opportunities for future studies and advance theoretical and empirical research at the intersection of these two important fields.

TABLES AND FIGURES

TABLE 1
Summary of BMI definitions and connections with entrepreneurship research

Literature reviews on business model innovation published in academic journals (2013-2018)		
Reference	Definition of BMI	Relationship with entrepreneurship
Schneider and Spieth, 2013	Business Model Innovation “aims to consciously renewing a firm's core business logics rather than limiting its scope of innovation on single products or services.” (p. 4)	(1) “Entrepreneurship [...] becomes particularly suitable to research on business model innovation where firms exposed to uncertainty are required to respond to changing sources of value creation by reconfiguring their established ways of doing business” (p. 19)
		(2) “Entrepreneurship literature offers a wide range of contributions on the identification, development and selection of opportunities for new ventures [...] building on these findings and transferring them to specific context of innovating an established business model [...] emerges as an interesting domain of future research.” (p. 21)
		(3) “In order to conduct business model innovation, remaining an entrepreneurial approach meanwhile resorting to a comprehensive understanding of a firm's initial situation and potentials arrives as of crucial importance for firms exposed to increasingly dynamics environments.” (p. 26)
Spieth et al., 2014	Business Model Innovation “poses [...] questions about novelty in customer value proposition and about respective logical reframing and structural reconfiguration of firms.” (p. 237)	(1) “A second aspect we identify in the ‘explaining the business’ perspective are processes and conditions that lead to a successful recognition of opportunities and adherent reconfiguration of resources to capture market value.” (p. 243)
		(2) “Opportunity recognition and processes of sense making versus cognitive biases [...] will almost certainly have an impact on processes of business model innovation. And finally questions on strategic agility and entrepreneurial/intrapreneurial actions arise.” (p. 243)
		(3) “The management and successful innovation of business model is consolidating as one fundamental source for competitive advantage [...] and the concept represents one important theoretical lens that enables us to refocus attention to the dimension of entrepreneurship and innovation in corporate strategy” (p. 244)

Wirtz et al., 2016	<p>Business Model Innovation “describes the design process for giving birth to a fairly new business model on the market, which is accompanied by an adjustment of the value proposition and/or the value constellation and aims at generating or securing a sustainable competitive advantage (Wirtz, 2016: 189)” (p. 3)</p>	<p>(1) “The entrepreneurial perspective has so far been lacking sufficient treatment when compared to the other two currents in the literature and thus seems to offer the greatest potential for additional research” (p. 5)</p> <p>(2) Entrepreneurship “seems [...] appealing for upcoming research.” (p. 17)</p> <p>(3) “Designing new business models is a challenging managerial and entrepreneurial task (Eppler and Homann, 2012; Eurich et al., 2014; Gobble, 2014).” (p. 12)</p>
Foss and Saebi, 2017	<p>Business Model Innovation represents “designed, novel, nontrivial changes to the key elements of a firm’s business model and/or the architecture linking these elements.” (p. 201, 216)</p>	<p>(1) “We also highlight the close interrelationship between BMI and entrepreneurship, which has not received sufficient attention to date.” (p. 220)</p> <p>(2) “Entrepreneurship is intrinsically linked to BMI: For startups, any act of entrepreneurship means the choice of a BM, while in established firms the exercise of entrepreneurial judgment results in changes in the BM’s components or architecture.” (p. 220)</p> <p>(3) “BMI is tightly linked to the idea of entrepreneurial vision, imagination, and judgment (Foss and Saebi, 2016).” (p. 220)</p>
Foss and Saebi, 2018	<p>Business Model Innovation means “designed, novel, nontrivial changes to the key elements of a firm’s business model and/or the architecture linking these elements.” (p. 13)</p>	<p>(1) “Relatively little is known empirically about where BMs come from [...] As a result, research on how BMs come into being (by entrepreneurial judgment and enactment [...] and the antecedents that trigger changes in the architecture between (complementary) BM elements that produce alterations to the BM are only emerging.” (p. 17)</p> <p>(2) Entrepreneurship theory is useful “in order to contribute to the theoretical as well as empirical advancement of the BM and BMI discipline”, in order to answer to the question of “What is the role of entrepreneurial “vision”, “imagination” and “judgment” in the design of BM and BMI?” (p. 17)</p>

TABLE 2
Inclusion and exclusion criteria for the selection of papers to be included in the review

Inclusion/Exclusion criteria	Description
Inclusion	Business Model Innovation is a clearly identifiable construct studied in relation to entrepreneurship, even if BMI is not the main focus of the study.
Inclusion	Entrepreneurship is a clearly identifiable construct studied in relation to BMI, even if entrepreneurship is not the main focus of the study.
Inclusion	The publishing source is listed in the ABS.
Exclusion	BMI is neither the main focus of the study, nor studied from the perspective of entrepreneurship
Exclusion	Entrepreneurship is not the perspective of the study, or no concepts related to entrepreneurship are used in the study.
Exclusion	The publishing source is not listed in ABS

TABLE 3
Overview of the 20 most cited references within the debate about BMI and entrepreneurship

Article	Short summary
Teece, D. J. (2010). Business models, business strategy and innovation. <i>Long range planning</i> .	Clarifies and defines the BM concept as design or architecture of the value creation, delivery, and capture mechanisms a firm employs, and articulate its importance for the fields of strategy, innovation, and economics.
Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. <i>Journal of Management</i> .	Provides a literature review and assessment of the concept of BM. They argue that despite research is developing in silos, BMs are emerging units of analysis that explain both how firms capture and create value.
Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. <i>Industrial and Corporate Change</i> .	Defines the BM as "heuristic logic" that connects the technical potential of technology with the economic value it can realize but that can potentially constrain ventures from developing their technologies in alternative directions.
Amit, R., & Zott, C. (2001). Value creation in e-business. <i>Strategic Management Journal</i> .	Explores how BMs developed around different themes (efficiency, complementarities, lock-in, and novelty) allow to capture value for ventures in e-business. They propose the BM as unit of analysis which "depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities."
Chesbrough, H. (2010). Business model innovation: opportunities and barriers. <i>Long Range Planning</i> .	Argues that since firms commercialize their offering through BMs, they need to develop the capability to innovate BMs as well. They explore the barriers to BMI, and suggest that processes of experimentation and effectuation as well as organizational change leadership can be used to overcome them.
Osterwalder, A., & Pigneur, Y. (2010). <i>Business model generation: A handbook for visionaries, game changers, and challengers</i> .	Discuss the various dimensions of business models and offer a framework to visualize them
Yin, R. K. (1984). <i>Case study research and applications: Design and methods</i> . London: Sage.	Methodological book suggesting research strategies to effectively conduct qualitative research based on case studies
Sosna, M., Treviño-Rodríguez, R. N., & Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. <i>Long Range Planning</i> .	Highlights the importance of innovating existing BMs (despite being successful in the current market) through processes of trial-and-error learning, and shed light on the different types of learning happening throughout the process of BMI

McGrath, R. G. (2010). Business models: A discovery driven approach. <i>Long Range Planning</i> .	Emphasized the importance of experimentation and trial and learning processes to develop new BMs under uncertainty.
Schumpeter, J.A. (1934). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. <i>Harvard Economic Studies</i> .	Classic of entrepreneurship providing a definition of what constitutes innovation and defines entrepreneurs as individuals who carry out new combinations (i.e., new things, or same things using different methods)
Eisenhardt, K. M. (1989). Building theories from case study research. <i>Academy of Management Review</i> .	Suggests several strategies for theorizing from qualitative studies based on single and/or multiple case studies
Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. <i>Journal of Business Research</i> .	Proposes BMs units of analysis "that can facilitate theory development in entrepreneurship." They explore the theoretical foundation of the BM concepts, and propose a six-component framework to define what BM are and what they include.
Baden-Fuller, C., & Morgan, M. S. (2010). Business models as models. <i>Long Range Planning</i> .	Highlights the different role that the concept of BM has for both academic research and practice. They argue that BM can be conceived as models that synthesize, describe, and classify different businesses; serve as unit of analysis for scholarly investigation; and serve as templates for managers.
Demil, B., & Lecocq, X. (2010). Business model evolution: in search of dynamic consistency. <i>Long Range Planning</i> .	They highlight that BM research tends to focus on the static notion of BM or at its dynamic transformation separately. They drive on the RCOV framework to look at BM evolution as a fine tuning process which considers both these dimensions.
George, G., & Bock, A. J. (2011). The business model in practice and its implications for entrepreneurship research. <i>Entrepreneurship Theory and Practice</i> .	The provide an entrepreneurial definition of the BM and its importance for entrepreneurial identification, selection, enactment, and exploitation of opportunities, and investigate empirically what it means for practitioners and how they use the concept.
Zott, C., & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. <i>Organization Science</i> .	Highlights the importance of the different BM design themes on the performance of entrepreneurial firms, and test the different themes on the performance of new ventures. Argues that novelty-oriented BMs are important for the performance of these firms.
Casadesus-Masanell, R., & Ricart, J. E. (2010). From strategy to business models and onto tactics. <i>Long Range Planning</i> .	The develop arguments for why and how the notion of BM differs from that of strategy. They argues that BMs are reflections of the realized strategy of the firm.
Johnson, M. W., Christensen, C. M., & Kagermann, H. (2008). Reinventing your business model. <i>Harvard Business Review</i> .	Suggests strategies that managers can use to understand the current BM of the firm and when and how existing it should be changed. Suggests that the main driver for BMI should be its potential to disrupt industries or markets.
Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying business models: Origins, present, and future of the concept.	Clarifies the concept of BM and its connections with Information Systems.

Zott, C., & Amit, R. (2010). Business model design: an activity system perspective. <i>Long Range Planning</i> .	Defines BMs as systems of activities, and argues that in designing new BMs firms should focus on the elements that define such "systems" (such as content, structure, and governance) as well as the themes (novelty, lock-in, complementarities and efficiency) guiding its development.
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TABLE 4
Legenda of the bibliographic coupling network with communities.

Node #	Article (First Author, Publication Year, Publication Source)	Community	Pub Year
4	BOHNSACK R, 2014, RES POLICY	1	2014
6	BOUWMAN H, 2018, ELECTRON MARK	1	2018
7	BROEKHUIZEN TLJ, 2018, BUS HORIZ	1	2018
12	FUTTERER F, 2018, LONG RANGE PLAN	1	2018
13	GARCIA-GUTIERREZ I, 2016, RES -TECHNOL MANAGE	1	2016
15	GUO H, 2017, R D MANAGE	1	2007
16	GUO H, 2016, ASIA PAC J MANAG	1	2016
19	LAUDIEN SM, 2017, R D MANAGE	1	2017
21	MARTINS LL, 2015, STRATEG ENTREP J	1	2015
22	MIKHALKINA T, 2015, ADV STRAT M	1	2015
24	MONGELLI L, 2017, IND INNOV	1	2017
27	OGILVIE T, 2015, RES -TECHNOL MANAGE	1	2015
29	REYMER I, 2017, R D MANAGE	1	2017
33	SHIN J, 2014, INT J TECHNOL MANAGE	1	2014
36	SVEJENOVA S, 2010, LONG RANGE PLAN	1	2010
38	TODESCHINI BV, 2017, BUS HORIZ	1	2017
40	VELU C, 2016, R D MANAGE	1	2016
41	VELU C, 2015, TECHNOVATION	1	2015
42	YAN MR, 2018, KNOWL MANAG RES PRACT	1	2018
43	YANG M, 2017, RES -TECHNOL MANAGE	1	2017
49	AMIT R, 2015, INT ENCYCL OF THE SOC & BEHAV SCI : SECOND ED	1	2015
52	BREUER H, 2018, INT J ENTREP VENTURING	1	2018
58	DAVIES IA, 2018, J CLEAN PROD	1	2018
65	GAUS O, 2016, IND HIGH EDU	1	2016
66	GOYAL S, 2017, THUNDERBIRD INT BUS REV	1	2017
67	GÜNZEL F, 2012, INT J ENTREPRENEURSHIP SMALL BUS	1	2012
70	KOÇOĞLU İ, 2018, DIGITAL MARKETING AND CONSUMER ENGAGEM : CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS	1	2018
71	KUMAR R, 2017, GLOB ENTREP AND NEW VENTUR CREAT IN THE SHAR ECON	1	2017
77	NIEUWENHUIS P, 2018, INT J ENTREPRENEURSHIP INNOV	1	2018
81	PIRSON MA, 2012, SOCIALLY RESPONSIBLE FINANCE AND INVESTING: FINANC INSTITUTIONS, CORPORATIONS, INVESTORS, AND ACTIVISTS	1	2012
83	RASK M, 2014, J INT ENTREP	1	2014
86	SCARINGELLA L, 2018, INT J ENTREPRENEURSHIP INNOV MANAGE	1	2018
89	SEIDENSTRICKER S, 2014, INT J ENTREPRENEURSHIP INNOV MANAGE	1	2014
90	SHALENDER K, 2018, J ENTERPRISING COMMUNITIES	1	2018
92	SPIETH P, 2016, R D MANAGE	1	2016
93	UYGUR D, 2016, WOMEN'S ENTREP IN GLOB AND LOCAL CONTEXT	1	2016
94	VELEVA V, 2018, J CLEAN PROD	1	2018
99	ZEBRYTE I, 2017, INT J ENTREP BEHAV RES	1	2017
100	ZHAO X, 2017, SUSTAINABILITY	1	2017

10	FOSS NJ, 2018, LONG RANGE PLAN	2	2018
14	GONDAL S, 2004, EUR J OPER RES	2	2004
20	LUBIK S, 2016, LONG RANGE PLAN	2	2016
23	MILES RE, 2009, CALIF MANAGE REV	2	2009
28	PALO T, 2013, IND MARK MANAGE	2	2013
39	TRIMI S, 2012, INT ENTREP MANAG J	2	2012
44	YUNUS M, 2010, LONG RANGE PLAN	2	2010
46	KARIMI J, 2016, LONG RANGE PLAN	2	2016
50	BOUNCKEN RB, 2016, INT J ENTREP VENTURING	2	2016
55	CLAUSEN TH, 2013, J TECHNOL TRANSF	2	2013
59	DECOSTER R, 2010, ENCYCLOPEDIA OF E-BUSINESS DEVT AND MGMT IN THE GLOBAL ECON	2	2010
62	ENGEL JS, 2011, RES TECHNOL MANAGE	2	2011
63	FLAMMINI S, 2017, BR FOOD J	2	2017
64	FLORIN J, 2011, J SOC ENTREP	2	2011
79	ONETTI A, 2012, J MANAGE GOV	2	2012
85	ROSCA E, 2017, J CLEAN PROD	2	2017
3	AUTIO E, 2017, STRATEG ENTREP J	3	2017
11	FOSS NJ, 2017, J MANAG	3	2017
17	HOLZMANN P, 2017, J MANUF TECHNOL MANAG	3	2017
25	NAJMAEI A, 2016, ENTREP RES J	3	2016
26	NEWTN J, 2016, ENTREP RES J	3	2016
30	RICHTER C, 2017, CREAT INNOV MANAG	3	2017
31	SANCHEZ P, 2010, EUR MANAG REV	3	2010
35	STIEGLITZ N, 2009, ADV STRAT M	3	2009
45	JAVALGI RRG, 2012, J BUS RES	3	2012
47	KIURA T, 2014, SYST RES BEHAV SCI	3	2014
51	BOUTELLIER R, 2010, E-ENTREPRENEURSHIP AND ICT VENTURES: STRATEGY, ORG AND TECHNOL	3	2010
53	CARVALHO JMS, 2017, ENTREP : CONCEPTS, METHODOL , TOOLS, AND APPL	3	2017
54	CHAKRAVARTHY B, 2008, J BUS STRATEGY	3	2008
56	COHEN B, 2007, J BUS VENTURING	3	2007
57	D'ANGELO MJ, 2015, HANDB OF RESEARCH ON GLOBAL COMPET ADVANT THROUGH INNOV AND ENTREP	3	2015
61	DOGANOVA I, 2009, RES POLICY	3	2009
68	HALME M, 2012, J MANAGE STUD	3	2012
69	ISHII M, 2014, WORLD REV ENTREP MANAGE SUSTAINABLE DEV	3	2014
72	MANGEMATIN V, 2003, RES POLICY	3	2003
73	MANSOUR D, 2017, J RES INTERACT MARK	3	2017
74	MÜTTERLEIN J, 2017, J MEDIA BUS STUD	3	2017
75	NAJMAEI A, 2015, INT J ENTREPRENEURSHIP SMALL BUS	3	2015
80	PAPAGIANNIDIS S, 2005, EUR MANAGE J	3	2005
82	RAS PJ, 2012, WORLD REV ENTREP MANAGE SUSTAINABLE DEV	3	2012
84	ROALDSEN I, 2014, INT J ENTREPRENEURSHIP INNOV MANAG	3	2014
87	SCHINDEHUTTE M, 2008, J SMALL BUS MANAGE	3	2008
88	SEELOS C, 2005, BUS HORIZ	3	2005
91	SOLVANG BK, 2009, INT J ENTREPRENEURSHIP INNOV MANAG	3	2009
95	VLAAR P, 2005, EUR MANAGE J	3	2005
96	WEIERMAIR K, 2007, TOUR RECREAT RES	3	2007

97	WITKAMP MJ, 2011, TECHNOL ANAL STRATEG MANAGE	3	2011
98	WITKAMP MJ, 2011, VOLUNTAS	3	2011
1	ABDELKAFI N, 2018, INT J TECHNOL MANAGE	4	2018
2	ANDRIES P, 2013, STRATEG ENTREP J	4	2013
5	BOJOVIC N, 2018, LONG RANGE PLAN	4	2018
8	DUNFORD R, 2010, LONG RANGE PLAN	4	2010
9	ERNKVIST M, 2015, TECHNOL FORECAST SOC CHANG	4	2015
18	LAIPI A, 2016, J BUS RES	4	2016
32	SCHALTEGGER S, 2016, ORGAN ENVIRON	4	2016
34	SNIHUR Y, 2016, ENTREP REG DEV	4	2016
37	THOMPSON JD, 2010, LONG RANGE PLAN	4	2010
48	ALBERTI FG, 2017, J BUS STRATEGY	4	2017
60	DOBSON K, 2018, J CLEAN PROD	4	2018
76	NEWTN J, 2017, ADV ENTREP FIRM EMERG GROWTH	4	2017
78	OLOFSSON S, 2018, J CLEAN PROD	4	2018

TABLE 5
Overview of the different research groups on Entrepreneurship and BMI

Subsets of studies	No. of articles	Overarching entrepreneurship-related question	Short description	BMI-related questions	Representative articles
1. The ideation of novel Business Models	39 (C1)	How do individuals and/or firms create and/or identify opportunities for new business models?	These studies focus on the cognitive and concrete triggers that lead entrepreneurs and managers to identify opportunities for innovating existing business models as both a response and a source of disruption in existing industries. They also develop arguments on the pivotal role of business model thinking in supporting the opportunity identification process across a variety of sectors (both high- and low-tech), overcome specific challenges (such as the commercialization of innovation, or the introduction of sustainability principles in existing businesses), and shed light on practical tools and methods that can support the opportunity identification process as well as their rationalization and framing in business model terms through visualization and scenario analysis.	i) How do entrepreneurs and managers ideate new business models and what are the triggers of the ideation process? ii) What is the role of business models in supporting the opportunity identification process? iii) Which tools can be used by managers and entrepreneurs to frame opportunities in business models terms, and what is the role of such tools in helping them select which opportunities are worth pursuing?	Bohnsak et al., 2014; Futterer et al., 2018; Garcia-Gutierrez & Martinez-Borreguero, 2016; Guo et al., 2016; Guo et al., 2017; Laudien & Daxbock, 2017; Martins et al., 2015; Svejenova et al., 2010
2. The Business Modelling process under uncertainty	29 (C2, C4)	How do new and established firms design and develop viable business models to exploit opportunities?	These studies focus on the processes and guiding principles through which new and established firms design and execute novel BMs as they enact and exploit opportunities. They specifically focus on the introduction of new BMs by newly born organizations, the capabilities and principles that incumbent firms need to renew their existing BMs, and the challenges and experimentation processes of developing novel business models in settings where market information is limited and	i) How do new ventures design innovative business models and adjust them as they grow? ii) How do established firms transform their business and go from one business to another? And iii) how does uncertainty impact	Andries et al., 2013; Bojovic et al., 2018; Dunford et al., 2010; Ernkqvist, 2015; Karimi & Walter, 2016; Lubik & Garnsey, 2016; Newth et al., 2017; Oloffson et al., 2018; Palo &

			uncertainty is high. Collectively, they point at the important role of experimentation and ongoing relationships with key stakeholders as new (and sometimes disruptive) BMs are developed and validated over time.	on business modelling decision?	Tähtinen, 2013; Schaltegger et al., 2016; Snihur, 2016; Thompson & MacMillan, 2010
3. The role of context and resources on entrepreneurial Business Modelling	32 (C3)	How do firms acquire and combine the resources required to design and execute new business models, and what is the role of markets and intra-firm contexts in these processes?	These studies focus on the impact of individual, organizational, and environmental contingencies play in processes of BM design and resource acquisition. Collectively, they show how novel BMs serve as classification devices to distinguish between different categories of firms in an industry, and in turn shape which resources these firms will need from which sources. They also show how business models can be used as narrative tools to obtain legitimacy, and shed light on the processes and strategies through which entrepreneurs pursue BMI in spite of potentially diverging interests both within and outside organizations. They also outline several individual, organizational, and contextual drivers of BMI decisions.	<ul style="list-style-type: none"> i) What is the resource context in which novel BMs emerge, and how do entrepreneurs acquire and combine the necessary inputs? ii) How do specific markets and institutional contexts shape entrepreneurial action related to the emergence of novel BMs? iii) What is the role of intra-firm factors (i.e., specific capabilities or organizational contexts) in enabling or hindering the emergence and adoption of new business models and the underlying entrepreneurial actions? 	Autio, 2017; Cohen & Winn, 2007; Doganova & Eyquem-Renault, 2009; Halme et al., 2012; Mangematin et al., 2003; Newth, 2016; Sanchez & Ricart, 2010; Schindehutte et al., 2008; Stieglitz & Foss, 2009

FIGURE 1
Number of papers about BMI and Entrepreneurship published per year (2003-2018)

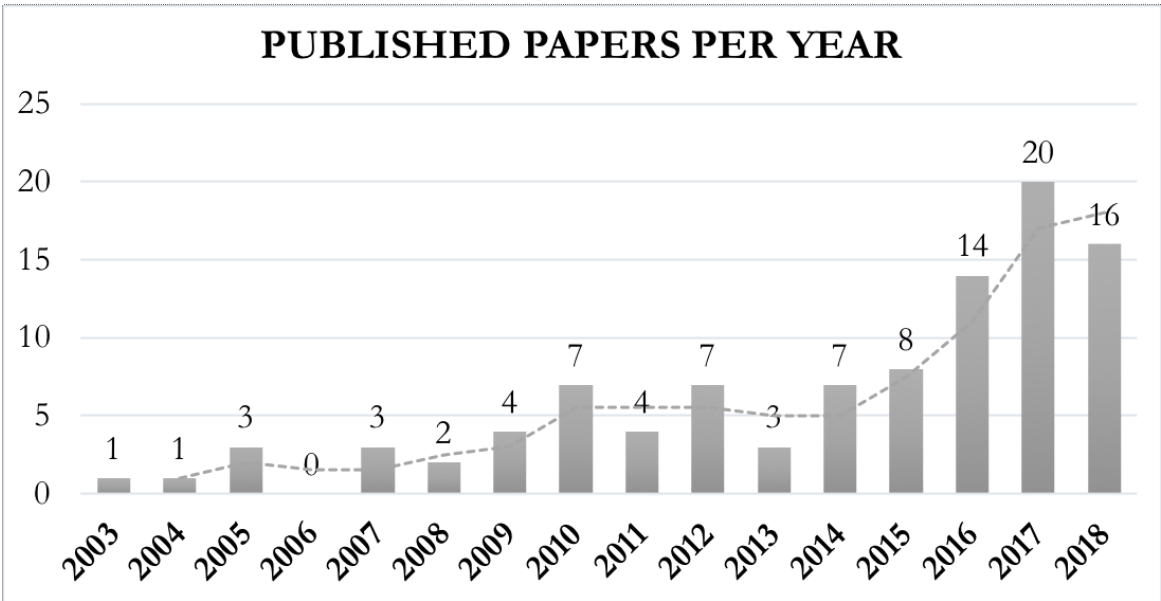


FIGURE 2
Bibliographic coupling network.

Bibliographic Coupling Network

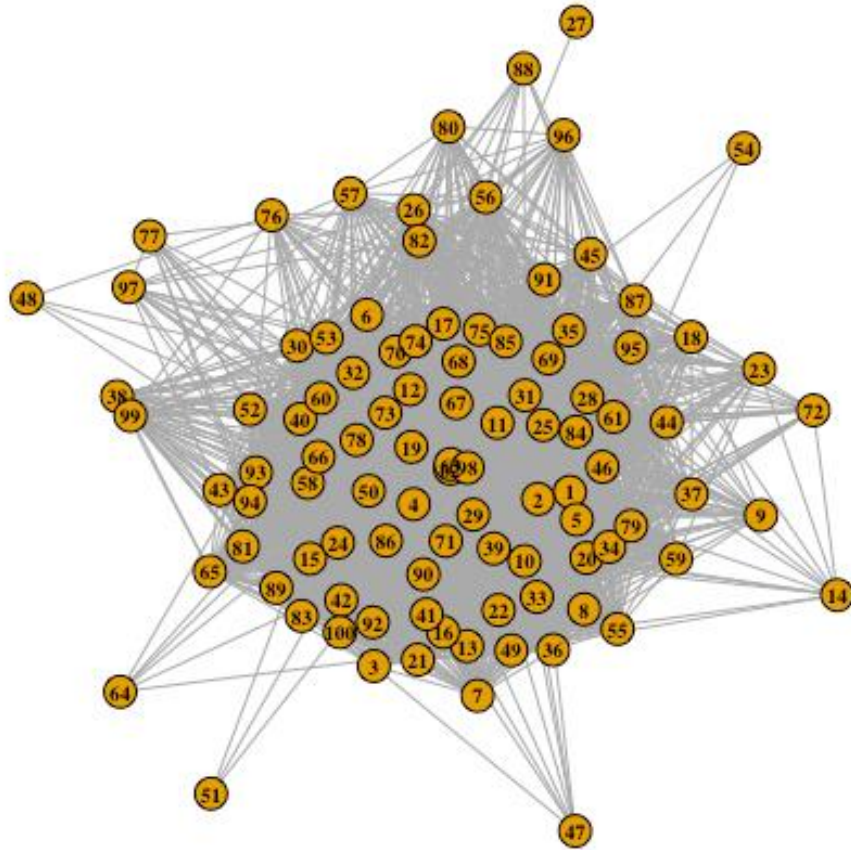
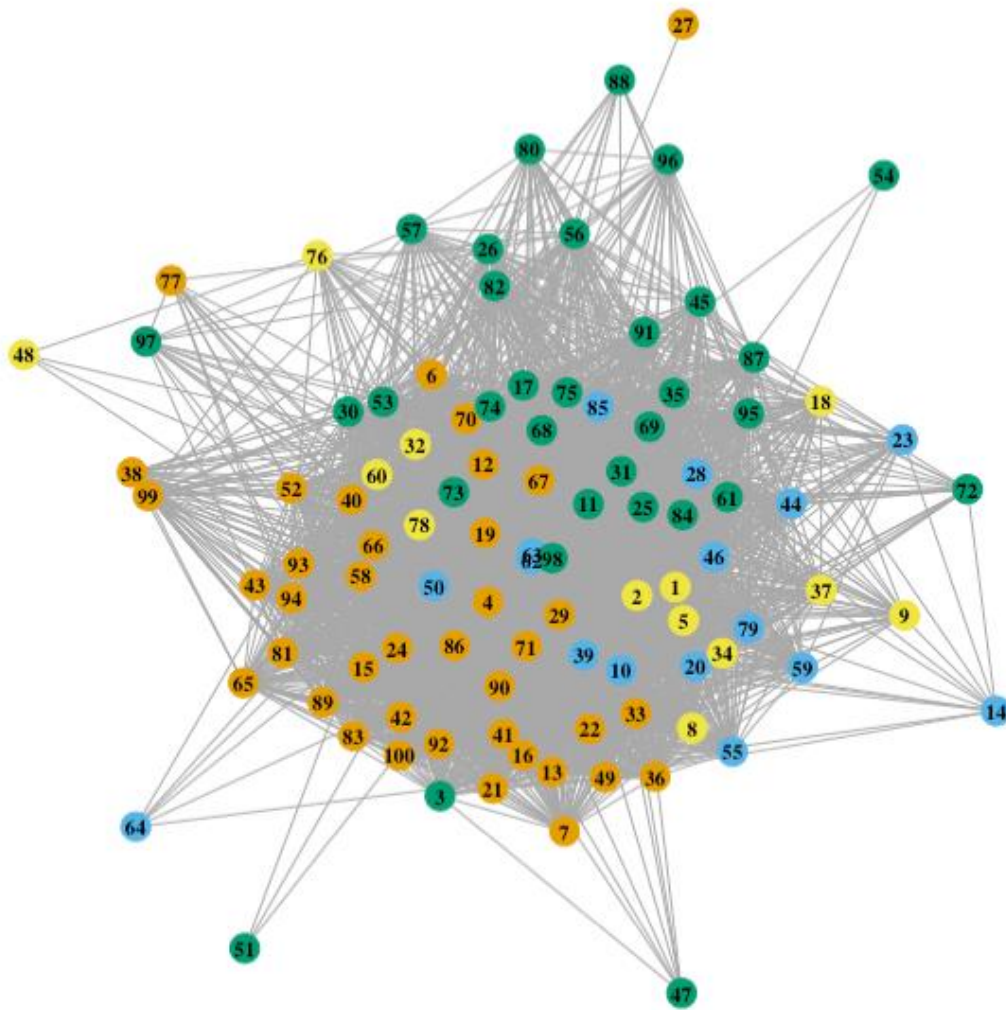


FIGURE 3
Bibliographic coupling network with communities.

Bibliographic Coupling Network with communities



Legenda:

- Orange= Community 1 (n=39), The ideation of novel Business Models;
- Blue = Community 2 (n=16), The Business Modelling process under uncertainty (process and form)
- Yellow = Community 4 (n=13), The Business Modelling process under uncertainty (uncertainty and decision-making)
- Green = Community 3 (n=32), The role of context and resources on entrepreneurial Business Modelling

SUPPLEMENTARY MATERIALS

APPENDIX 1

Selected Articles on BMI and Opportunity Identification

Article	Title	Question / Focus	Context / Methodology	Relevance for opportunity identification
Opportunity identification and new business models ideation: how do entrepreneurs and managers ideate new business models and what are the triggers of the ideation process?				
Svejenova et al., 2010	An Individual Business Model in the Making: a Chef's Quest for Creative Freedom	Why, what and how changes in an individual entrepreneurs' business models occur as it develops over time.	Development of the business model of a chef which includes (but is not limited to) working in a restaurant- single case study	They show how motivational triggers based on personal interest lead individuals to identify initial business models, and how these are subsequently changed based on career progression.
Bohnsak et al., 2014	Business models for sustainable technologies: Exploring business model evolution in the case of electric vehicles	The aim is to identify the main competing business models that have emerged following the introduction of a new technology in the automotive industry; trace the evolution of different business models over time; uncover how incumbent and entrepreneurial firms have influenced such evolution; shed light on processes that shape the development of a (future) dominant business model. They ask: what is the impact of incumbent and entrepreneurial firms' path dependencies on the evolution of business models?	The commercialization of electric vehicles in the automotive industry – multiple cases	They show how knowledge from adjacent industries (as a form of path dependency) is used differently by new entrants and incumbent firms to ideate (more or less) innovative business models to commercialize a new technology (in this case, electric vehicles)
Martins et al., 2015	Unlocking the hidden value of concepts: a cognitive approach	Articulating the cognitive logics and processes through which existing schema (i.e., existing business models) can be innovated even in the absence	Conceptual paper with illustrative evidence from the cases of Tesla Motors, Aravind Eye Care, and	They conceptualize BMI as a process of schema change, and explicitly focus on how opportunities for creating new BMs can be identified through two cognitive processes that

	to business model innovation	of exogenous change. The specifically focus on two cognitive processes through which corporate managers and entrepreneurs alike can systematically generate ideas for new business models	Better Place (for analogical reasoning) as well as Starbucks, Cirque du Soleil and Best Buy (for conceptual combination)	individuals use to cope with novelty: analogical reasoning and conceptual combination
Guo et al., 2016	Business model innovation: The effects of exploratory orientation, opportunity recognition, and entrepreneurial bricolage in an emerging economy	They empirically test the relation between exploratory orientation and BMI and the mediating effect of opportunity recognition concrete actions and the ability to combine resources in novel ways (i.e. entrepreneurial bricolage) on this relation.	Quantitative paper based on a dataset of 186 Chinese firms randomly sampled in the provinces of Shandong and Shaanxi.	They empirically test how firms' exploratory orientation facilitates the pursuit of concrete actions and practices aimed at identifying opportunities and think of ways to combine existing resources differently, and shows that these are the conduits through which innovative business models are generated.
Velu & Jacob, 2014	Business model innovation and owner-managers: the moderating role of competition	They empirically investigate what is the role of the entrepreneur as both owner and manager of the firm in enabling the emergence of new business models, and to what extent different degrees industry competition may affect this relationship.	Business model innovations in the US and European bond trading markets between 1995 and 2004.	They drive on effectuation theory to develop arguments on the importance of having an holistic view of the business to come up with more novel ideas to disrupt existing business models, and highlight that this is something that managers that are also owners of the firm are more likely to have. The positive relation between the presence of the entrepreneur as both manager and owner and the innovativeness of the BM being developed, however, is less positive in highly competitive environments.
Laudien & Daxböck, 2017	Business model innovation processes of average market players: a qualitative-empirical analysis	They seek to understand enablers and barriers to model innovation developed by average market players (as opposed to market leaders), focusing on two RQs: (1) How do average market players approach business model innovation in general? (2) How do business model innovation	Multiple cases of 10 B2B German SMEs with a number of employees between 25 and 250.	They show how firms identify opportunities for renewal through a trial-and-error process of experimentation, which starts with a thorough analysis of the current environment and the identification of misfits with the firm's current BM, and proceeds along incremental steps that lead to radical changes over time.

		processes of average market players look like in detail?		
Futterer et al., 2018	Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance	They focus on effectual VS causal reasoning as guiding logics to ideate innovative business models in the context of corporate venturing, and test the moderating role of industry growth on the positive relationship between either causation and effectuation and BMI.	128 corporate ventures in Germany across various industries including (financial) services, machinery and plant engineering, automotive, IT/software, telecommunications, energy, chemical industry, logistics, passenger transportation, pharma, public sector or building industry.	The conceptualize effectuation and causation as potential enablers of firms' ability to identify opportunities for BMI, and highlight the conditions under which one is more effective than the other as guiding logic enhancing corporate entrepreneurs' ability to identify opportunities for more innovative BMs. They find that while causal reasoning is effective for developing BMI in low growing industries, effectuation is more effective in high growing contexts.
Opportunity identification through business model thinking: what is the role of business models in supporting the opportunity identification process?				
Shin, 2014	New business model creation through the triple helix of young entrepreneurs, SNSs, and smart devices	How do new business models enabled by social networks and the diffusion of smart devices (i.e., smartphones, tablets, etc.) and have helped entrepreneurs to build firms and profit from these innovations?	New, entrepreneurial firms in Korea. They use interviews with 102 CEOs and subsequently analyze the factors that are deemed important to create new BMs through cluster analysis.	They assess three dimensions based on which entrepreneurs can identify and exploit opportunities to create new products and profit from them: creating novelty, exploiting the wealth-creation potential of social networks, and exploiting the wealth-creation potential of smart devices. To identify opportunities in this context, entrepreneurs should focus on maximizing the interactions between these three axes.
Velu, 2015	Business model innovation and third-party alliance on the survival of new firms	How does the degree of business model innovation pursued by new ventures affect their survival? And how do third-party alliances with firms owning complementary assets impact this relation?	Quantitative study on a dataset of 129 new firms that launched electronic trading platforms in the US bond market between 1995 and 2004 following the advent of Internet technology.	They empirically demonstrate then when evaluating opportunities and deciding which ones to pursue, entrepreneurs should seek for either vary cautious improvements of current BMs or very radical innovation. They find a curvilinear (U-shaped) relationship between BMI and firm survival, with minimum performance levels being associated with intermediate levels of BMI.

Guo et al., 2017	Opportunity recognition and SME performance: the mediating effect of business model innovation	They propose that business model innovation mediates the relation between opportunity recognition and the performance of SMEs and empirically test this relationship.	Quantitative study on a dataset of 155 Chinese SMEs	They conceptualize the design of novel business models as a key mechanisms through which recognized opportunities are transformed into superior performance.
Broekhuizen et al., 2018	Implementing new business models: What challenges lie ahead?	They focus on the challenges faced by industry disruptors when seeking to introduce a new-to-the-industry business model.	Illustrative evidence from four mini-cases	They identify specific strategic trade-offs faced by industry disruptors when deciding how to implement new business models. They then relate strategic decisions about the different ways through which opportunities can be exploited to firms' exploratory/exploitative orientation, and show 3 alternative paths along which new BMs can be developed: competing on perceived value, competing on price, competing on a mix of perceived value and price.
Reymen et al., 2016	Decision making for business model development: a process study of effectuation and causation in new technology-based ventures	They focus on how the use of effectual, causal, and bricolage logics enable entrepreneurs developing innovative technology to design different BM components over time as they bring their innovations to the market.	Multiple case study of 4 technology-based new ventures	They emphasize on how different decision making logics can be used over time to identify opportunities and build an initial business model to bring technological innovations to the market. They also link each guiding logic with the design of different components business models' components, and track their development over time.
Frameworks and tools to support business model thinking and opportunity identification: which tools can be used by managers and entrepreneurs to frame opportunities in business models terms, and what is the role of such tools in helping them select which opportunities are worth pursuing?				
Seidenstricker & Linder, 2014	A morphological analysis-based creativity approach to identify and develop ideas for BMI: A case study of a high-tech manufacturing company	How do frameworks based on morphological thinking help entrepreneurs and managers identify BMI opportunities and select which ones are viable?	Multiple case study of incumbent firms in the brewery industry seeking to rejuvenate their current BM and expand to Asian markets	They present a framework that identifies which design areas and parameters entrepreneurs should pay attention to when identifying opportunities and think of possible BMs to exploit them. They argue that that the design phase is then followed by a consistency check phase among the different elements of the identified BM.

Günzel & Wilker, 2012	Beyond high tech: The pivotal role of technology in startup business model design	They focus on how a specific framework (here, the business model dynamic framework) helps entrepreneurs identify BMI opportunities and rationalize them through a business modelling process.	Multiple case study of three startups (a precious metal trader, an healthcare venture, and a semiconductor water manufacturer).	The show how frameworks that enable visualization and mapping of the current state of the art enable entrepreneurs to identify opportunities for innovating current BMs. The framework can also be used to compare alternative BMs before starting a venture and evaluate them based on their value creation potential, as well as to design and adjust BMs over time as environments change.
García-Gutiérrez & Martínez-Borreguero, 2016	The Innovation Pivot Framework Fostering Business Model Innovation in Startups	Presenting the Innovation Pivot Framework as practical tool through which entrepreneurs can identify opportunities to design different (and novel) BMs for their innovations (i.e. potentially pivot their business in different directions).	Conceptual paper with illustrative evidence from examples	They present the Innovation Pivot framework as practical tool to support entrepreneurs envision opportunities, identify alternative uses of their innovations (i.e., alternative BMs), and evaluate them based on their value-creation potential.
Yan, 2018	Improving entrepreneurial knowledge and business innovation by simulation-based strategic decision support system	Explaining the usefulness of simulation-based strategic decision support systems as methods to support strategic planning and BM development.	Firms developing either market-driven or sustainability-driven innovations.	They develop arguments on the effectiveness of simulation methods in serving as entrepreneurial knowledge-enhancing tools, which allow entrepreneurs to evaluate the impact on the business of different strategies and alternative BMs. Specifically, they relate these systems to BM identification for both market-driven and sustainability-driven innovations.

APPENDIX 2
Selected Articles on BMI and Opportunity Enactment and Exploitation

Article	Title	Question / Focus	Context / Methodology	Relevance for opportunity exploitation and decision making
New venture development and business model design: how do new ventures design innovative business models and adjust them as they grow?				
Dunford et al., 2010	Business Model Replication for Early and Rapid Internationalisation The ING Direct Experience	What are the processes through which business models are discovered, adjusted, and fine-tuned “by doing” as new ventures internationalize and go global?	Longitudinal, single case study of the early development and internationalization of ING direct as a global retail bank	They illustrate four processes through which new ventures test and select a BM and replicate it in different institutional context. They show that while the core principles remain the same in replication attempts, their operationalization is left to the decisions of the local managers through processes of principle-based replication that depend on people acting on their own initiative. Each scaling initiative in another country (exploitation) is treated as experiment to incorporate feedback and adjust the core BM (experimentation). This process is dynamic and iterative, non-linear.
Ernkvist, 2015	The double knot of technology and business-model innovation in the era of ferment of digital exchanges: The case of OM, a pioneer in electronic options exchanges	How do new (resource-constrained) ventures create new markets that transform old ones through innovative business models?	Longitudinal, single case study of the development of OM, a Swedish venture founded in 1984 that introduced the first electronic options market in Sweden and became an authorized Swedish Exchange in 1993	They focus on the era of ferment following a technological innovation, and suggest that new ventures can introduce innovations that challenge the status quo through two entrepreneurial processes: bricolage technology entrepreneurship, and corporate political entrepreneurship. The effectiveness of these entrepreneurial actions is contingent upon a socio-political system that encourages new ventures to experiment with new BMs, as well as a high degree of industry participation in the pursuit of innovation opportunities.
Flammini et al., 2017	Business model configuration and dynamics for technology	They focus on the BMI process associated with the exploitation of emerging technologies, and ask: how do new ventures support the	The commercialization of 3D printing in the food industry	They show that BM design and re-design occurs during the deployment phase of the technology commercialization process, and that the process of designing innovative business

	commercialization in mature markets	technology commercialization process via the development of novel BMs?		models go through iterative stages of BM design and reconfiguration that keep iterating throughout they venture life-cycle, and are triggered by both endogenous and exogenous factors.
Lubik & Garnsey, 2016	Early Business Model Evolution in Science-based Ventures: The Case of Advanced Materials	They focus on early business model design and change for the commercialization of radical, generic technologies.	Multiple case study involving three UK-based university spin-offs developing advanced materials	They show that generic technologies present unique challenges due to the fact that preliminary BM design occurs before a route to market has been selected, and may change several times as opportunities arise, even before the first sales have begun. In this context, entrepreneurs go through initial experimentation followed by focused value creation, and design BMs iteratively based on how their perception of the opportunity they want to exploit evolve over time. The right BM does not immediately appear to the entrepreneur but evolves along an iterative entrepreneurial learning process.
Miles et al., 2009	The I-Form Organization	They propose the I-Form (the Innovation-Form) as organizational model that allow emerging firms to effectively engage in market exploration, an emerging BM based on inter-organizational collaboration that can lead to superior advantage in fast changing environments.	Illustrative evidence from two cases (Syndicom, a startup firm in the medical speciality of spine surgery, and Blade.org, a community of firms in the computer server marketplace). Both are examples of I-Form organizations.	They start from the premise that opportunities to create new BMs are successfully exploited only when there is a good fit with the supporting organizational forms underlying them. They propose and illustrate the I-Form as organizational model to build novel, collaborative BMs based on ongoing market exploration (continuous search for fit between the firm's product and the target market).
Onetti et al., 2012	Internationalization, innovation and entrepreneurship: Business models for new technology-based firms	They focus on the BM dimensions on which new technology-based firms developing business around a new technological platform must decide upon.	Conceptual paper based on literature on BM design for new technology-based firms	They shed light on the distinctive challenges that new technology-based ventures face as they seek to enact and exploit opportunities, related to globalization, pace of innovation and pressure from competition. The argue that the strategic decisions that these firms must take are around: i. the location of activities; ii. The

				relationships with other players and about organizational boundaries; iii. The selection of activities on which the company's effort are mostly focused.
Palo & Tähtinen, 2013	Networked business model development for emerging technology-based services	They focus on the dynamic process of development of a networked business model (i.e., a BM involving a network of commercial and non-commercial actors) in the context of emerging technology-based services.	Qualitative, single case study on the development of an urban computing project; main sources of data are interviews with managers and participation to strategic meetings.	They highlight that despite the choice of the appropriate BM is critical for successful technology commercialization, BMI research has largely ignored that fact that the development of new technologies is often a process involving multiple actors in a network of relations. As such, the study focuses on the dynamic process of development of networked BMs. The paper traces the development process of a networked BM as links it with the opportunity identification and exploitation process. Overall, it provides a template for the development of business models for technology-based services.
Snihur, 2016	Developing optimal distinctiveness: organizational identity processes in new ventures engaged in business model innovation	They focus on identity-shaping actions of new ventures engaged in BMI. Specifically, they ask: how do new ventures that introduce innovation make claims about uniqueness and category membership when shaping organizational identity?	Multiple case study of 4 new ventures in the healthcare communication, online grocery, digital payment systems, and vacation rentals businesses introducing new to the industry BMs	They show the strategies that entrepreneurs and organizations use to establish their identity and gain legitimacy when pursuing BMI. These include storytelling, use of analogies, the pursuit of social evaluations by external actors - such as business competitions that enable comparisons with other similar ventures, or obtainment of certification or accreditation by legitimate external actors - and the establishment of alliances.
Trimi & Bergebal-Mirabent, 2012	Business model innovation in entrepreneurship	They focus on the BM design practices and tools that entrepreneurs can deploy as they develop new technology-based ventures.	Literature review based on a database of 132 papers included in the Scopus and 65 in the ISI Web of Knowledge databases about BM design, entrepreneurship, and innovation.	They identify four major BM design practices that new technology-based ventures can deploy as they grow: i) Open business models; ii) The Business Model Generation Canvas; iii) Customer development models; iv) The Lean Philosophy

Yunus et al., 2010	Building Social Business Models: Lessons from the Grameen Experience	They focus on processes of development of social business models that, due to the new value propositions, architecture, and profit equations they require, resemble BMI.	Longitudinal, single case study of the development of Grameen Bank	Through the analysis of Grameen Bank's BM evolution, the study presents 5 lessons learned from the process that entrepreneurs developing social BMs can apply, 3 of which are common to all types of BMI and 2 of which are specific to social BMs: challenging conventional wisdom, setting up appropriate partnerships, undertaking experimentation, and for social BMs involve socially-oriented stakeholders, and state the intended social profit explicitly.
Corporate renewal and business model transformation: how do established firms transform their business and go from one business to another?				
Alberti & Varon Garrido, 2017	Can profit and sustainability goals co-exist? New business models for hybrid firms	Practitioner-oriented paper on how established firms can innovate their BM by incorporating sustainability principles, and thus embrace apparently competing and yet synergistic goals	Single case study of WYG-WYG (What-you-get is What-you-give), a hybrid organization that introduced a new fundraising BM.	They shed light on the differences between traditional and hybrid organizations, and disentangle a typology of 4 hybrid BM archetypes that organizations can embrace. For each model, they describe the potential advantages, limitations/challenges, and strategies and capabilities needed to implement it. They argue that studying hybrid ventures is important to shed light on the practices that organizations can deploy to foster corporate innovation by learning from hybrid firms, and draw on an exemplary case study to provide recommendations as for what these practices are.
Foss & Saebi, 2018	Business models and business model innovation: Between wicked and paradigmatic problems	They focus on defining what BM and BMI means in the context of firms' and industries' transformations (different scopes of BMI), and highlight the ways scholars can use the construct.	Essay paper	They provide a conceptual framework to understand what BM and BMI are, arguing that the key element of their definition resides in their conceptualizations as, respectively, architecture of the business and modifications of such architecture. They illustrate a framework to understand they different types of BMI a firm can pursue, and highlight that entrepreneurship scholars interested in organizational transformation can use BMI as

				either dependent, independent, and/or mediating/moderating variable.
Karimi & Walter, 2016	Corporate Entrepreneurship, Disruptive Business Model Innovation Adoption, and Its Performance: The Case of the Newspaper Industry	They focus on whether and how a firm's being entrepreneurial — which is defined by prominent CE attributes — affects BMI adoption and how BMI adoption affects business model performance. Two research questions are addressed: what are the prominent CE attributes that impact disruptive BMI adoption? And to what extent does disruptive BMI adoption influence business model performance?	Quantitative study based on a web survey on established companies in the newspaper industry, analyzed through structural equation modelling	They explicitly link BMI adoption with entrepreneurial constructs. They find that autonomy, risk-taking attitude, and proactiveness are positively related with BMI adoption, whereas innovativeness is not. They also find that disruptive BMI adoption has a nonlinear impact on business model performance – that is, at high levels of disruptive BMI adoption its impact on business model performance is high, while at medium levels of disruptive BMI adoption its impact on business model performance is marginal.
Newth et al., 2017	Challenges of hybridizing innovation: Exploring structural attractors as constraints	They focus on the challenges of implementing social BMs through hybridization	Single case study of a project led by World Vision New Zealand (WCNZ), a nonprofit fundraising organization	They argue that the challenges of building and developing a social BMs – specifically with regards to the resistance it may face in established sectors and organizations – may be best explained by complexity theory, and specifically the concept of structural attractors. They show that when faced with changes in institutional and market conditions, the very factors that enabled the initial success (i.e., its structural constraints) of the venture initially may hinder its subsequent development.
Oloffson et al., 2018	Journey and impact of business model innovation: The case of a social enterprise in the Scandinavian electricity retail market	They focus on novel BMs introduced by social enterprises (i.e., new BMs driven by sustainability issues), and explore the events that triggered BMI over time at a social enterprise in Scandinavia.	Evidence from a social enterprise operating in the Scandinavian electricity retail market (data are collected from sixteen individual interviews and two focus groups with executives, managers, and directors).	They argue that BMI is both an organizational change process and an outcome of this process, analyze the literature on BM design and BMI, and link specific events (linked to changes in the people, innovation ideas, legal and social contracts associated with the innovation, external incidents, and judgments by external audiences) to changes in specific BM dimensions, to show how such events may shape the design of the BM over time. the show that the process of developing a novel

				social BM over time entails shifting from novelty (and via lock-in of customers) to efficiency in internal management routines. They also argue that BM introduced by social enterprises can trigger change at the industry level.
Schaltegger et al., 2016	Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation	They focus on what is the role of (both new and established) companies in introducing sustainable business models. Specifically, they focus on how both niche pioneers and large incumbents can introduce new BMs for sustainability that change their markets.	Real-world, illustrative evidence of both venture-dominated as well as incumbent-dominated retention and co-evolution of sustainable BMs.	They propose a conceptual framework based on evolutionary theory (variation – or introduction of completely new BMs – selection – or differential elimination of unsustainable BMs by market competition and selection of sustainable alternatives – and retention – diffusion of sustainable BMs by pioneers and incumbents) to explain how firms change market and make them more sustainable, and argue that niche pioneers can use indirect mechanisms to change markets, such as business model replication or mimicry by other players in the market (they can thus change market through imitation). They thus also introduce 4 pathways (growth, replication, M&As, and mimicry) through which sustainable BMs get diffused.
Business modelling under uncertainty: how does uncertainty impact business modelling decisions?				
Andries et al., 2013	Simultaneous experimentation as a learning strategy: business model development under uncertainty	They focus on how the experimentation process in the early stages of BM development looks like, and how it can be effectively organized. The particularly focus on examining (1) whether different approaches to learning and experimentation exist and, if so, (2) what are the rationale and implications of such approaches	Longitudinal case study design of six ventures active in various industries. Data obtained from 28 interviews, 17 business plans, 75 press articles, and 250 pages of other internal company documents. For each case, they document and analyze changes in the BM components, the number of BMs	They highlight two alternative approaches for BM development under uncertainty (based on the organizational/entrepreneurial learning literature) – focused commitment (to capitalize on learning efforts) and simultaneous experimentation (as a search approach). They analyze: (1) why ventures opt for a specific search approach; 2) how they develop and redefine their BM under uncertainty; and (3) how these choices affect the development trajectory of the venture - they show empirically 2 alternative approaches for early

			experimented with (any different combination is considered to be a different BM), as well as the relatedness of a venture's experiments.	BM development, and drive implications for the short and long term survival of new ventures operating under uncertainty (new, products, new markets..)
Bojovic et al., 2018	Learning, signaling, and convincing: The role of experimentation in the business modelling process	They focus on the (different) roles of experimentation in the business modelling process	Qualitative study of 2 startup companies in their early years, introducing novel BMs in the connected health care sector, an industry where new BMs that give customers central stage are particularly important.	They show the process through which new ventures engage in problem solving and build legitimacy through experimentation, which serves to test preliminary hypothesis about a BM or its components, in a controlled and real life environment. They argue that experimentation enable ventures to learn over time, signal their value to key audiences, and convince them to engage with the new BM. These three roles are mutually reinforcing.
Bouncken et al., 2016	The role of entrepreneurial orientation and modularity for business model innovation in service companies	They investigate which dynamics capabilities produce BMI, particularly for service firms.	299 German service firms (data obtained through survey)	They focus on two capabilities (entrepreneurial orientation (EO) and modularity) as BMI enablers, and argue that these two capabilities positively impact the emergence of new BMs in cases of high uncertainty. They conceptualize uncertainty as enabler (and thus not constraint) for BMI, but do not find support for the interaction between EO and modularity.
Dobson et al., 2018	Successfully creating and scaling a sustainable social enterprise model under uncertainty: The case of ViaVia Travellers Cafés	They focus on the challenges and decisions that successfully creating and scaling a sustainable social business under uncertainty entails.	Longitudinal case study of ViaVia Travellers Cafés (a social enterprise that has successfully scaled its operations to 16 locations covering four continents), on which they collected information covering a period of more than 25 years	They argue that the classical dynamics of test and validation and subsequent scaling of the BM may not be as linear as depicted in previous studies when firms have to scale their businesses in uncertain and highly volatile settings – in these settings, instead, the design and scaling of BM follows a more iterative process in which development and scaling occur simultaneously, and each scaling attempt

				is treated as an experiment to improve the current BM.
Thompson & MacMillan, 2010	Business Models: Creating New Markets and Societal Wealth	They focus on providing guiding principles for BM design under high uncertainty (i.e., settings in which availability of market information is very limited, if any).	Illustrative qualitative evidence through mini cases drawn from the Wharton Societal Wealth Program	They offer a framework to orient decision making for designing new BMs in face of little market information, and contextualize it in the setting of new BMs to address societal issues such as poverty. Specifically, they find that to face high uncertainty, managers have to transform into risk by starting reducing the initial set of possibilities to those that are plausible, assigning a probability distribution and thus plan the expected outcomes accordingly. They then provide guiding principles that venture and corporate managers can apply to design new BM that open up new markets.

APPENDIX 3
Selected Articles on Exogenous and Endogenous Influences on Entrepreneurial Business Modelling

Article	Title	Question / Focus	Context / Methodology	Relevance for resource acquisition and entrepreneurship in context
BMI and resource acquisition: what is the resource context in which novel BMs emerge, and how do entrepreneurs acquire and combine the necessary inputs?				
Doganova & Eyquem-Renault, 2009	What do business models do? Innovation devices in technology entrepreneurship	They focus on the different roles that BMs play in technology-based ventures as they are shaped and re-shaped over time throughout the venture development process.	Single case study of Koala, a university spin-off venture developing a mobility technology. They use mostly secondary data (and two interviews) to reconstruct the evolution of the BM over time, and the ways it is communicated to audiences.	They conceptualize the BM as a boundary object between new technology-based ventures and the multiple audiences from which the venture needs resources. It allows to narratively plot the venture and make it understandable for such audiences. Business Models change as they incorporate feedback from the different audiences and thus guide the development of the venture; when a BM is selected and gain success, it can influence future ventures serving as a template for imitation.
Halme et al., 2012	Innovation for Inclusive Business: Intrapreneurial Bricolage in Multinational Corporations	They focus on how intrapreneurs (middle managers) can use intrapreneurial bricolage strategies to gather resources inside their organization to develop innovative business models aimed at serving low-income markets.	2 cases of innovative BMs to serve low-income markets developed by Nokia and ABB.	They define intrapreneurial bricolage as a resource acquisition strategies for middle managers intrapreneurs. They argue that through entrepreneurial bricolage organizational members can gather and mobilize internal resources despite developing business models that contrast with their companies mindsets and can potentially cannibalize existing models. Bricolage is a particular way of addressing these challenges, but needs to underpinned by organizational tolerance.
Holzmann et al., 2017	User entrepreneur business models in 3D printing	They aim at shedding light on the BMI processes through which user entrepreneurs exploit entrepreneurial opportunities based on products,	They analyze and compare the Bms of eight user entrepreneurs in the 3D printing industry in Europe	They shed light on the different resources required by user entrepreneurs in the 3D printing industry to develop innovative business models, and argue that such BMs

		technologies, or services of which they are also users.	and America, and use Multiple Correspondence Analysis to analyze similarities and differences in their business models.	comprise the unique resources and capabilities that these entrepreneurs need to compete in the market. They argue that BMs can be classified and selected by firms based on the cost of opportunity exploitation and the number of potential customers.
Mangematin et al., 2003	Development of SMEs and heterogeneity of trajectories: The case of biotechnology in France	They aim to understand the variety of possible Bms along which small and medium biotech firms in France develop. They ask: why do some biotech SMEs grow while others remain small, and what is pattern of development of these firms?	60 biotech SMEs in France. Data on each firm were collected through face-to-face interviews. On average, the 60 SMEs had 45 employees and a turnover of about 4.1 millions.	They argue that the BM of the firm can be used as classification tool to categorize different types of firms and the resources they need along their development process. Using the BM to understand which resources are likely to be needed by whom, in turn, allows to better understand competitive dynamics for the same resources, as well as the emerging structure of relations in an industry.
Najmaei, 2015	How Do Entrepreneurs Develop Business Models in Small High-Tech Ventures? An Exploratory Model from Australian IT Firms	The study focuses on how entrepreneurs running new ventures configure and allocate resources to develop novel Bms as they seek to gain unique positions in the market.	Qualitative study of five ventures in the Australian ICT Industry.	They argue that since BMs differ among firm, in turn there are differences in the unique resource configurations through which such Bms are developed. Thus new Bms are developed as unique bundles or configuration of available resources. They articulate the BM development process in three stages, along which such resource combinations are ideated, tested, and orchestrated to deliver returns.
Papagiannidis & Li, 2005		They present a new BM based on skills brokerage, through which new ventures with scarce resources can acquire the skills they need without spending a lot of cash.	They present the model and then illustrate how it worked in three cases: one example in the collateral printing solutions, one startup developing a football news website, and one venture in the transaction processing and messaging software industry.	The skills brokerage model allows new ventures to acquire the skills they need as they grow by selling portions of their returns on equity on a temporary basis (i.e., the duration of the contract with the skills provider) instead of through cash payments.

Witkamp et al., 2011		They ask: i) how can social business models scale despite being antagonists to current (institutionalized) market values? And ii) how can social entrepreneurs developing them prevent the loss of their social values as they manage relations with stakeholders with different values and obtain resources from them?	Qualitative study base on interviews and survey data from 57 actors in the social entrepreneurship domain in the Netherlands.	They offer an account of how social entrepreneurs can be legitimized and acquire resources from stakeholders belonging to different 'regimes' (i.e., with different institutional norms guiding their actions and thoughts as for what constitute a service to society). They argue that to scale beyond the social entrepreneurship niche to mainstream markets, social entrepreneurs need to acknowledge the existence of such other regimes and focus on the values they share rather than those that are incompatible.
Business modelling in context: how do specific markets and institutional contexts shape entrepreneurial action related to the emergence of novel BMs?				
Autio, 2017	Strategic Entrepreneurial Internationalization: A Normative Framework	The author offers a normative framework for entrepreneurial actions during processes of internationalization, and ask: how can entrepreneurs build capabilities to successfully internationalize in the first place? And what should they do to develop such capabilities?	Conceptual paper	The author argues that experimentation with different BM configurations is essential for successful internationalization, and that entry in each market should be used as 'testing and retention' heuristic on which BM adjustment decisions for each context should be based. Therefore, entrepreneurs can build the capability to scale the business internationally by using the principles of lean methodologies and treating entry in each market as a BM test – that is, testing the assumptions at the basis of the BM and retaining only those that are well-received by the market.
Cohen & Winn, 2007	Market imperfections, opportunity and sustainable entrepreneurship	They focus on how imperfections in existing markets lead to the emergence of opportunities for the creation of new technologies and business models.	Theoretical paper with illustrative evidence	They focus on how market imperfections create entrepreneurial opportunities for the development of radical technologies and innovative business models. They develop arguments on four types of market imperfections (i.e., inefficient firms, externalities, flawed pricing mechanisms and information asymmetries) which create opportunities for new models of sustainable entrepreneurship that enable entrepreneurs to

				improve societal and environmental contexts while appropriating the rents stemming from entrepreneurial activity.
Javalgi et al., 2012	Entrepreneurship, muddling through, and Indian Internet-enabled SMEs	They analyze how Indian entrepreneurs identify and exploit opportunities for developing novel business models with a focus on their decision making processes. They ask: how do emerging, fast growing, and turbulent environments such as India impact BM decisions?	They use data from corporate reports, websites, and business news of three ventures that survived the dot-com bubble in India and successfully built their BM despite an highly competitive and uncertain environment	They argue that high turbulence of emerging markets constrain entrepreneurs to rely on a step by step DM approach, in which planning is difficult and all options cannot be foreseen upfront. They support the argument with three cases of Indian SMEs that have survived despite such turbulent environment.
Newth, 2016	Social Enterprise Innovation in Context: Stakeholder Influence through Contestation	The author analyzes how contexts (i.e., contestation among multiple stakeholders) shapes BM design decisions and the processes underlying its development in the setting of social entrepreneurship.	Ethnographic study of a social enterprise in New Zealand	He provides evidence on how the context in which the social enterprise in New Zealand was developed ultimately shaped the decisions and processes underlying the development of its BM. Specifically, they show how particular decisions were induced by the diverse expectations, beliefs, and logics of the stakeholders from which the venture needed resources. They also show that contestation with each stakeholder depends upon its salience for the venture, and overall contestation with the environment changes over time as norms, economic contexts, and institutions change.
Richter et al., 2017	Digital entrepreneurship: Innovative business models for the sharing economy	How is the new, emerging context of sharing economy enabling/shaping the emergence of new BMs? And is the sharing economy a new BM in and of itself?	Qualitative study of entrepreneurs who founded a business in one of the sharing economy segments (i.e. sharing of digital content, of physical goods, and crowdfunding).	They shed light on the drivers, requirements and goals that the context of sharing economy poses to entrepreneurs seeking to develop new BMs in this setting.
Sanchez & Ricart, 2010;	Business model innovation and	They aim at understanding how the context of low-income markets	BMI in low-income markets.	They show how context-related factors such as resource munificence and environmental

	sources of value creation in low-income markets	influences BM configurations. They explore different BMs in such markets, and seek to understand the contextual factors influencing BMI in these settings.		dynamisms (predictability) interrelate with firm-level factors (such as a firm's products attributes or the complexity of its value chain, as well as the firm's capabilities, routines and management systems) to shape BM decisions (and specifically, whether an exploitation- or exploration-oriented BM is better suited to enter a developing country, and to what degree the firm needs to interact with or create an ecosystem of external partners).
Seelos & Mair, 2005	Social entrepreneurship: Creating new business models to serve the poor	The focus on how the context of developing countries can shape the emergence of new business models targeted at serving the poor.	Social entrepreneurship in developing countries.	They argue that firms can target new markets and develop new social entrepreneurship models can arise by focusing on the unmet, humanitarian needs of people in developing countries, that are willing but not able to pay for these basic services. They also highlight that these new BMs can be developed through collaboration with institutions such as large and NGOs and international organizations to cater humanitarian needs.
Intra-firm influences on business modelling: what is the role of intra-firm factors (i.e., specific capabilities or organizational contexts) in enabling or hindering the emergence and adoption of new business models and the underlying entrepreneurial actions?				
Chakravathy & Lorange, 2008	Driving renewal: The entrepreneur-manager	The focus on the characteristics, skills, and personality traits of managers with an entrepreneurial orientation (as driver of BMI)	Illustrative evidence from mini-cases of Nestlé, Nespresso, Ericsson, Dow Chemical, and HP	They argue that to execute renewal through BMI, managers need to have an entrepreneurial orientation. Entrepreneurs-managers with this orientation, specific skills and personality, and long experience are able to lead firms to embrace new BMs that generate renewal.
Stieglitz & Foss, 2009	Opportunities And New Business Models: Transaction Cost And Property Rights Perspectives On Entrepreneurship	They focus on the role of entrepreneurs' expectations in their understanding of the economic organization of entrepreneurship and the choices they make as for how to design business models. They ask: how exactly expectations about value appropriation drive entrepreneurial	Theoretical paper	They shed light on how BM design choices may be driven by entrepreneurs' expectations as for which resource configurations potentially yields the highest value creation potential. They apply ideas from transaction cost economics, property rights theory, and organizational economic to develop argument as for how entrepreneurs develop the internal structure of

		search and the design of business models?		the firm (i.e., hierarchy, employee incentives, as well as buyer-supplier relationship and the structure of the value chain), and stimulate entrepreneurial behavior (search for opportunities) by the firm's employees, and the role of the organizational structure in the process of evaluating potential entrepreneurial opportunities.
Najmaci, 2015	Causes of heterogeneity in the entrepreneurial business modelling of small firms: A human capital perspective	The author focuses on the role of human capital in entrepreneurial business modelling.	Quantitative study based on a survey of 222 CEOs of Australian manufacturing firms	The study tests the human capital predictors and performance outcomes of entrepreneurial business modelling. They distinguish between entrepreneurs' specific human capital (i.e., specific to the context of the firm – tenure, level of acquired market knowledge, level of acquired technological knowledge) and general (level of education and general managerial experience) human capital, and test the effect of these factors on managers' attitude towards exploring new BMs associated with flexibility, change, and innovation, which in turn mediates the relation between human capital and firm growth. They find that BMI negatively relates to tenure but is positively related to specific knowledge of the technological underpinning of the business.
Mütterlein & Kunz, 2017	Innovate alone or with others? Influence of entrepreneurial orientation and alliance orientation on media business model innovation	They focus on the drivers of BMI in the media industry following increasing digitalization. They ask: how do entrepreneurial and alliance orientations influence media companies' abilities to innovate their business model?	Quantitative study based on a survey of 50 German companies.	They hypothesize that BMI is underpinned by an entrepreneurial mindset and firms' attitude towards partnering with others. They find a positive relations between entrepreneurial orientation (here operationalized as innovating alone, i.e. developing one's own app for content distribution) and BMI. They argue that media companies that want to pursue BMI need to acquire an entrepreneurial mindset which puts emphasis on autonomy for their

				employees and an aggressive approach to competition.
Roaldsen, 2014	Dynamic capabilities as drivers of business model innovation- from the perspective of SMEs in mature industries	The focus on how firms' dynamic capabilities drive BMI adoption for entrepreneurial purposes in mature industries.	Longitudinal case study from the food industry in Norway (31 interviews with 19 informants).	For each case, they analyze the evolution of different BMs over time, providing a description of the type of BM and its main features. They find 5 DCs associated to firms' ability to act entrepreneurially, identify opportunities for new BMs, and execute them.
Schindehutte et al., 2008	Understanding market-driving behavior: The role of entrepreneurship	They clarify the construct of market-driving behavior and argue that it is different from market orientation, and underpinned by firms' entrepreneurial capital.	Conceptual paper with illustrative examples	They argue that a strong entrepreneurial orientation enables firms to develop entrepreneurial capital, a key resource that, in turn, enables them to develop unique value creating and appropriating combinations (i.e., BMs) that drive markets instead of being driven by them.
Vlaar, 2005	Why incumbents struggle to extract value from new strategic options: Case of the European Airline	They develop a framework to explain which factors hinder incumbent firms' ability to extract value from new, disruptive BMs that re-shape competition and disrupt existing advantages in established industries.	The setting is the airline industry. They compare incumbents' and new entrants' business modelling strategies in the aftermath of the rise of the low-cost model.	They conclude that in the case of the airline industry, incumbents' inability to react to the introduction of the low-cost model was caused by slow response to the new model, and failure to embrace it full scale. Instead, incumbents searched for compromise between the extant model (exploitation) and elements of the new one (exploration) and this approach was not successful. The current assets created fixed costs that lead to greater inability to react.

FOSTERING CORPORATE INNOVATION THROUGH COLLABORATION WITH ACCELERATORS: A TYPOLOGY

ABSTRACT

Engaging in corporate entrepreneurship activities is crucially important, but challenging for most incumbent firms. While the corporate entrepreneurship literature has largely focused on entrepreneurial activities that incumbent firms initiate within their boundaries – such as growing internal or external corporate ventures or creating corporate accelerators – it has left unexplored how external organizations such as accelerators can help corporations overcome the challenges of corporate entrepreneurship and foster innovation. Through an interview-based qualitative study involving various accelerators worldwide, we explore how accelerators help corporations explore opportunities, connect with new ventures, and foster internal innovation. Our findings reveal four ways through which accelerators create value for incumbent firms and help them engage in corporate entrepreneurship: i) *vertical acceleration programs (verticals)*; ii) *scouting services*; iii) *pilot experimentation programs (pilots)*; iv) *intrapreneurship programs*. We develop a typology that distinguishes these different solutions along two dimensions – the extent to which they address well-defined or unspecified innovation goals, and their focus on individual firms or networks of collaborating organizations. Our findings advance understanding of how intermediary organizations such as accelerators help firms pursue corporate entrepreneurship activities, and encourage a rethinking of the role of accelerators in entrepreneurship and innovation.

Keywords: corporate entrepreneurship; exploration; accelerators; intermediaries

INTRODUCTION

One of the most significant challenges facing incumbent firms is how to sustain a positive performance and remain competitive in the long run by systematically exploring opportunities and enacting innovation (Baden-Fuller, 1995; Bhardwaj et al., 2006; Lavie et al., 2010; March, 1991; Raisch & Tushman, 2016). For some – usually high-tech, digitally-native companies such as Tesla, Netflix, Hewlett Packard, or Cisco – continuous innovation is simply part of the organizational mission or DNA (e.g., Sidhu, Volberda, & Commandeur, 2004). Many others, however, struggle to realize it and face growing challenges in keeping up with the pace of ever-changing markets as they age and grow (Sørensen & Stuart, 2000). Corporate entrepreneurship scholars have long recognized these issues (Covin & Miles, 1999; Dess & Lumpkin, 2005; Guth & Ginsberg, 1990; Ireland, Covin, & Kuratko, 2009; Kuratko & Audretsch, 2013; Sharma & Chrisman, 1999; Westfall, 1969; Zahra, 1991), and a growing body of studies has sought to explore the determinants of incumbent firms' entrepreneurial activities and behaviors (Bhardwaj et al., 2006; Chen & Nadkarni, 2017; Raisch & Tushman, 2016).

This work has provided valuable insights into the corporate entrepreneurship activities of established firms, including internal corporate venturing (Burgelman, 1983; Covin, Garrett, Kuratko, & Shepherd, 2019; Kola-Nystrom, 2008; Raisch & Tushman, 2016; Thornhill & Amit, 2001), investments in new ventures through corporate venture capital (CVC) (Basu, Phelps, & Kotha, 2011; Basu, Wadhwa, & Kotha, 2016; Dushnitsky & Lenox, 2005a, 2005b; Katila et al., 2008; Wadhwa & Kotha, 2006; Wadhwa, Phelps, & Kotha, 2016), alliances and inter-organizational relations with new ventures (Minshall, Mortara, Valli, & Probert, 2010; Pisano, 1990; Teng, 2007; Weiblen & Chesbrough, 2015), and more recently the design and implementation of corporate accelerators (Jackson & Richter, 2017; N. Richter, Jackson, & Schildhauer, 2018; Shankar & Shepherd, 2018). Collectively, these studies emphasize that these modes of corporate entrepreneurship are valuable means through which incumbent firms systematically explore new knowledge, identify opportunities for creating innovations, and appropriate value from them.

This emerging stream of research, however, has also highlighted that corporate venturing, innovation and strategic renewal activities, and corporate acceleration are “complex and time consuming” (Chen & Nadkarni, 2017: 38), entail significant risks (Shimizu, 2012), and require specific resource endowments, managerial capabilities, and organizational support (Burgelman, 1983; Raisch & Tushman, 2016; Zahra, Jennings, & Kuratko, 1999). For these reasons, organizations that engage in such activities oftentimes do not realize the expected results. Corporate managers may be unwilling to invest large sums of money into risky new business whose returns on investments may only be seen after several years (Thornhill & Amit, 2001), unable to enact the learning mechanisms to absorb knowledge from the ventures they have been investing in and thus obtain positive learning returns from them (e.g., Cohen & Levinthal, 1990; Wadhwa & Kotha, 2006), or lack the legitimacy and trust they need to convince entrepreneurs to initiate inter-organizational relations with them (Katila et al., 2008). Organizational members, on their part, may not have enough time or the right skills to run corporate accelerators inside corporations (e.g., Richter et al., 2018) and fall into cultural clashes with entrepreneurs (Jackson & Richter, 2017) which may lead to frustration and failure of these initiatives.

While this body of work has focused on how corporate entrepreneurship activities can be implemented within the boundaries of the firm as well as the challenges of doing so, it has paid less attention to solutions offered by innovation intermediaries such as research and technology organizations (Howells, 2006), venture associations (Giudici et al., 2018), innovation consultants (Bessant & Rush, 1995), science parks and incubators (Phan, Siegel, & Wright, 2005), and business accelerators (Tracey et al., 2018). Yet due to their important role as knowledge brokers across industries and providers of resources and capabilities that help corporations with the innovation process (e.g., Bessant & Rush, 1995; Howells, 2006), these organizations may create value for corporations by helping them overcome the challenges and risks of pursuing corporate entrepreneurship activities.

In this study, we address this gap by mapping the different ways through which business accelerators – an emerging yet increasingly important category of intermediaries – help incumbent firms innovate. Since these organizations have distinct skills in growing new businesses and are central actors within entrepreneurial ecosystems (Cohen et al., 2018; Goswami et al., 2018) – two important characteristics that may provide significant benefits to large incumbents that do not have the same network positioning and specific expertise – collaboration with accelerators are particularly germane for established firms seeking to enact corporate entrepreneurship activities. These collaborations are widely diffused in practice. A global report published in 2016 by Gust¹¹, for instance, shows that more than 50% of accelerators worldwide benefit from corporate funds, and more than 60% of them plans to generate growing revenues by providing innovation services to corporations. Yet collaborations between corporates and accelerators are an emerging phenomenon, on which research is still lacking. As a result, we only have a limited theoretical and practical understanding of how accelerators may benefit incumbent firms, and one that neglects their important role as intermediaries in corporate innovation.

To address this omission, we draw on an inductive qualitative study of accelerators offering corporate services worldwide to develop a typology of the different ways through which accelerators create value for corporations by serving as independent partners helping them enact corporate entrepreneurship activities, and shed light on the different implications of each collaboration path for incumbent firms. We identify four different ways through which accelerators help corporations innovate: i) *industry verticals*; ii) *scouting*; iii) *pilots*; and iv) *intrapreneurship programs*. These four solutions can be distinguished along two dimensions: the extent to which they serve a well-defined or rather unspecified innovation goal, and the degree to which they are focused on fostering innovation through collaborations between firms or by solving the challenges of individual corporates. Our arguments have important implications for theory and future research

¹¹ Report available at: http://gust.com/accelerator_reports/2016/global/

on corporate entrepreneurship and accelerators. First, we extend research on the different ways through which corporations can enact corporate entrepreneurship activities by shedding light on solutions residing outside the boundaries of the firm, which involve inter-organizational relations with intermediary organizations such as accelerators. We show how, by collaborating with organizations with distinctive skills and favorable network positioning, established firms can engage in exploratory initiatives without committing to significant resource investments, tap on specialized knowledge and expertise only when needed, and ultimately reduce the risks and challenges associated with exploration. Second, we challenge the current conceptualization of accelerators as organizational sponsors offering short-time, limited-duration educational programs for entrepreneurial ventures by highlighting how they create value for incumbent firms by offering a much more variegated array of services to both corporates and startups than is depicted in prior work. We identify a wide array of accelerators' corporate services, explain in-depth their functioning, compare them, and explain the strategic considerations and trade-offs that managers can consider while choosing the appropriate collaboration path. The typology that we present provides valuable theoretical and practical insights into these choices, and has relevance for both academics and practitioners.

BACKGROUND

Corporate entrepreneurship

A well-established research tradition has explored how established firms can become more innovative by pursuing corporate entrepreneurship activities. Corporate entrepreneurship is defined as “a set of firm activities encompassing innovation, corporate venturing, and strategic renewal” (Chen & Nadkarni, 2017: 37) aimed at “regularly and systematically recognize and exploit entrepreneurial opportunities.” (Ireland et al., 2009: 19; Eisenhardt, Brown, & Neck, 2000; Murray, 1984; Sharma & Chrisman, 1999). More recently, scholars have included corporate accelerators as part of corporate entrepreneurship activities (Shankar & Shepherd, 2019). This body of work has provided valuable insights into the strategies that firms use to engage in corporate entrepreneurship

activities, as well as the potential advantages (e.g., Zahra, 1995; Zahra & Covin, 1995) and risks of doing so (e.g., Chen & Nadkarni, 2017; Shimizu, 2012).

First, established firms can engage in corporate entrepreneurship by encouraging employees and managers to pursue systematic search activities (Zahra, 1995, p. 19995; Zahra & Covin, 1995) aimed at identifying opportunities for creating new technologies and products, and growing new businesses (e.g., Ahuja & Lampert, 2001; Raisch & Tushman, 2016). Not all firms, however, are equally capable of successfully performing these tasks. For some, the risks arising from decision-makers' autonomy and freedom to pursue corporate entrepreneurship activities may outpace their benefits (Shimizu, 2012). Other organizations become less able to systematically engage in entrepreneurial behavior as they age and grow, due to accumulated knowledge base, skills, and managerial beliefs that constrain managers' attention (e.g., Vuori & Huy, 2016) and organizations' ability to identify and deploy the new knowledge required to generate innovation (Cohen & Levinthal, 1990; Leonard-Barton, 1992; Levitt & March, 1988; Tripsas & Gavetti, 2000), leading decision-makers to favor investment in familiar activities rather than unknown and uncertain territories (Ahuja & Lampert, 2001; Levinthal & March, 1993). Others suffer from limited resource endowments (Nohria & Gulati, 1996; Sidhu et al., 2004), are slowed down by lengthy decision-making processes and structural rigidities (e.g., Greve, 2011), or fail to champion investments in exploratory projects within the firm in order to grow them into successful new businesses (e.g., Burgelman, 1983; Raffaelli, Glynn, & Tushman, 2019; Raisch & Tushman, 2016). All these conditions, in turn, constrain established firms' ability to innovate (Sørensen & Stuart, 2000) and limit the extent to which they engage in corporate entrepreneurship.

Another way through which incumbent firms can enact innovation is by investing in internal or external corporate venturing activities – that is, investing financial resources in creating and growing a new venture within or outside organizational boundaries (Sharma & Chrisman, 1999). Both internal and external corporate venturing investments can be valuable ways through which established corporations develop new knowledge and capabilities, generate innovation, and

ultimately grow their businesses by financing ventures that create new products and/or open new markets (Burgelman, 1983; Dushnitsky & Lenox, 2005b, 2005a; Kuratko, Covin, & Garrett, 2009; Sharma & Chrisman, 1999; Thornhill & Amit, 2001; Wadhwa & Kotha, 2006). Not all established firms, however, are equally capable – or equally willing – to invest in promising ventures and transforming them into vehicles for corporate innovation. First, decision-makers within corporations are often discouraged from investing large sums of money into new ventures since corporate ventures – like all emerging firms – often “take several years to become profitable” (Thornhill & Amit, 2001: 27), and thus corporate venturing activities are risky businesses, whose returns (if any) can only be seen in the long run. “Highly desirable” startups (Katila et al., 2008: 325), furthermore, may sometimes enact defense mechanisms against investment by established corporations, if they perceive that the benefits of cooperation and resource sharing with incumbent firms may be outpaced by the risks of competition and resource misappropriation (Doz, 1987; Katila et al., 2008). Second, the success of corporate venturing initiatives is contingent upon established firms’ ability to effectively manage the portfolio of internal and external ventures they invest in, which entails taking decisions as for how much capital should be invested and how to best allocate it in terms of number of investments, diversity among the ventures, and fit with the parent company (e.g., Dushnitsky & Lenox, 2005a; Thornhill & Amit, 2001; Wadhwa & Kotha, 2006; Wadhwa et al., 2016). Furthermore, corporate managers should be able to carefully handle the relationship with the ventures they invest in over time (Thornhill & Amit, 2001), and ensure them an adequate level of commitment and resources while simultaneously protecting their distinctive identity, autonomy and flexibility against the corporate partner (e.g., Raisch & Tushman, 2016).

Finally, large established firms can access innovative ideas and enact exploration activities by designing and implementing their own corporate incubators or accelerators (Gassmann & Becker, 2006; Jackson & Richter, 2017; Kohler, 2016; N. Richter et al., 2018; Shankar & Shepherd, 2018; Weiblen & Chesbrough, 2015) in order to support startups and collaborate with them in

exchange for financial, educational and business opportunities, as well as co-location within the corporate's facilities for a limited period of time. These programs can be important means through which incumbent firms co-create innovations with young ventures (Weiblen & Chesbrough, 2015) and experiment with them in a protected and controlled environment (Kanbach & Stubner, 2016; N. Richter et al., 2018). Despite these potential benefits, however, designing and managing successful corporate accelerators entail significant resource investments and substantial challenges for the corporate host (Jackson & Richter, 2017; Kohler, 2016; Sivonen et al., 2015; Weiblen & Chesbrough, 2015), and accounts of corporate accelerators that have failed within the first two years of activity are not rare (see, for instance, a recent research by CB insights available here: <https://www.cbinsights.com/research/corporate-accelerator-failure/>). Running effective corporate accelerators is costly and time consuming, and requires corporate managers to develop distinctive abilities in startups selection and mentoring in order to find the right startups that can truly create value for the hosting corporate, as well as to design a beneficial value proposition for the participating ventures that provides them appropriate education components as well as access to relevant corporate data to favor pilots and experimentation. Second, corporate accelerators – like corporate venturing activities – entail investments in risky new businesses, whose returns can only be seen in the long run, and may thus not be an appropriate solutions for those corporates who want to see the impact of their investment within short timeframes (it may, for instance, take more than one or two cohorts before a truly valuable startup comes out from the accelerator). Corporate accelerators may also become a site of conflicts and misunderstanding as well as cultural clashes between corporate members and entrepreneurs (Jackson & Richter, 2017), which in turn can significantly undermine the effectiveness of these initiatives. They may, for instance, never fully integrate within the hosting corporate, and remain 'ivory towers' within which startups work on their ventures without engaging with corporate members, ultimately leading to a waste of time and resources. Internal accelerators thus do not fit the needs of firms with limited resources availability

– for whom they may be prohibitively expensive – or whose engagement with startup is aimed at realizing quick financial returns – for whom the timing may be too long.

Collectively, these arguments suggest that despite the crucial importance for established firms of engaging in systematic exploration and enactment of innovation opportunities in order to sustain growth and maintain competitive advantages in the long run, these firms can face significant challenges and constraints in doing so by relying on solutions that are inside their boundaries, such as engaging managers and employees in innovation and strategic renewal activities, investing in corporate ventures, and running corporate accelerators. This body of work, however, has largely neglected solutions to these issues that can be found outside organizational boundaries, such as those offered by emerging innovation intermediaries like consulting firms or innovation hubs offering bridge-making services (Bessant & Rush, 1995; Sapsed et al., 2007), venture capital investors, digital incubators, and business accelerators.

Innovation intermediaries and accelerators

Collaborations with innovation intermediaries such as consultancy firms, innovation hubs, incubators, and accelerators are an increasingly important way through which established firms explore innovation opportunities and access the external knowledge they need to generate innovations (e.g., Bessant & Rush, 1995; Howells, 2006). These collaborations are widely diffused in practice. In Europe, for instance, a 2015 survey on the Open Innovation activities on more than 500 companies across 36 countries conducted by the European Academic Network for Open Innovation¹² shows that the use of external networks such as associations, intermediaries, and knowledge brokers is among the five most intensively adopted open innovation activities of European respondent firms. Startup Europe Partnership (SEP), an organization founded in 2014 by the European Commission, claims to connect “the best startups” with “the best corporates and

¹² Available at <https://oi-net.eu/m-oinet-network/m-oinet-key-topics/m-wp2-industrial-needs/968-report-on-industrial-needs-for-open-innovation-education>

investors with a single goal: make things happen.” (<https://startupeuropepartnership.eu>). Similarly, famous US-based accelerators such as TechStars or Plug and Play as well as Asia-Pacific accelerators (Chakraberty, 2017) increasingly offer corporate services or run acceleration programs on behalf of established firms (Bonzom & Netessine, 2016), and consulting firms such as Accenture offer bridge-making services (Kavathekar et al., 2015).

Intermediaries – “a range of organizations including brokers, third parties and agencies that are involved in supporting the innovation process” (Howells, 2006: 715) – can be valuable allies for incumbent firms seeking to enact corporate entrepreneurship strategies. Innovation intermediaries provide resources and specific skills to established firms, including appraisal of corporates’ technology and innovation needs, strategy consultancy, connections with technology providers, and human resources (Bessant & Rush, 1995) that may help them build the capabilities that are needed to to pursue corporate entrepreneurship activities successfully (Bessant & Rush, 1995; Giudici, Reinmoeller, & Ravasi, 2017; Howells, 2006; Teece, 2012). Scholars have found that intermediaries can serve as “knowledge repository” (Howells, 2006: 716) on which clients can tap when needed (Teece, 2012), as brokers of technology and knowledge across sectors (e.g., Gassmann, Daiber, & Enkel, 2011; Hargadon, 1998; Hargadon & Sutton, 1997), as bridge-makers helping firms sense and seize entrepreneurial opportunities (Sapsed et al., 2007), as well as facilitators in the commercialization of innovations (Clayton, Feldman, & Lowe, 2018).

Available studies on innovation intermediaries have found that organizations such as research and technology centres (Howells, 2006), venture associations (Giudici et al., 2018), innovation consultants (Bessant & Rush, 1995), science parks and incubators (Phan et al., 2005) can help incumbent firms engaging in exploration activities by helping them search for opportunities in distant sectors (Kokshagina, Le Masson, & Bories, 2017; Lin, Zeng, Liu, & Li, 2016), create new products (Colombo, Dell’Era, & Frattini, 2015; Tran, Hsuan, & Mahnke, 2011), and develop specific capacities for innovation (Bessant & Rush, 1995; Giudici et al., 2018; Kokshagina et al., 2017; Spithoven & Knockaert, 2012). This body of research, however, has not

yet examined how the services offered by these organizations may create value for incumbent firms by supporting them addressing the risks, significant resource investments, and challenges of pursuing the complex strategic initiatives underlying corporate entrepreneurship.

In this paper, we seek to address this limitation by focusing on one prominent but still understudied category of emerging intermediaries, that is business accelerators. Accelerators are an emerging category of organizations that is particularly germane for corporate innovation, due to their distinctive skills on entrepreneurship and business development as well as their prominent role within existing entrepreneurial ecosystems (Cohen et al., 2018; Goswami, Mitchell, & Bhagavatula, 2018), which facilitates connections between corporates and young ventures. Scholars have sometimes mentioned that established firms can collaborate with independent accelerators to help them innovate without committing to the significant risks and resource investments of running accelerators programs themselves (e.g., Kohler, 2016; Shankar & Shepherd, 2019). Despite the potential benefits of collaborating with accelerators for enacting corporate entrepreneurship activities, there is a surprising dearth of research considering accelerators as external partners for established firms, whose distinct knowledge and expertise can help them overcome the risks and limitations of pursuing corporate entrepreneurship and fostering innovation. Overall, the question of how accelerators may create value for corporations by helping them exploring opportunities for renewal and enacting innovations remains largely unanswered. This paper aims at complementing the promising but still underdeveloped body of work on accelerators, as well as research on corporate entrepreneurship. We conceptualize accelerators as intermediaries whose services to established firms can provide solutions to the risks and challenges of pursuing corporate entrepreneurship activities by acting from outside the boundaries of the firm. We address the following research question: *what are the different ways through which corporates can partner and collaborate with accelerators to foster corporate entrepreneurship and innovation?*

METHOD

Corporate services provided by accelerators is a recent phenomenon, on which very limited theory is available. Therefore, we designed our study as an inductive, interview-based study of accelerators, including complementary observations and archival data collection (Edmondson & Mcmanus, 2007; Fayard et al., 2017). Motivated by the aim of understanding how corporates engage with business accelerators, which services they offer, and how these services work, we theoretically sampled our informants (Glaser & Strauss, 1967) by analyzing the websites of 136 accelerators worldwide. We began by analyzing the websites of accelerators affiliated to the Global Accelerator Network (GAN) (105), a worldwide community whose members span six continents. We then expanded our search beyond the GAN network by reading press news and scanning the Internet, and included in our initial sample 33 additional organizations that do not belong to the GAN. Coherently with our research question, we analyzed in detail each organization in this subsample focusing our attention on organizations with a background as business incubators and accelerators who have subsequently leveraged their expertise in working with startups at the service of corporations. We consulted the website of each of them and organized information in an Excel spreadsheet in which we listed the organizations' names, country, and industry focus (if any). We then divided the sample into two groups based on whether each accelerator in the sample offers services to established firms or not. By analyzing information included in the websites, we eventually retained 48 organizations mentioning corporate services out of 138 accelerators analyzed, of which 24 belong to the GAN and 24 not belong to it. These include the most famous US-based accelerators such as TechStars and Plug & Play, as well as younger organizations in Europe and Asia. Figure 1 shows the geographic location of the accelerators in our sample.

-----INSERT FIGURE 1 ABOUT HERE-----

Not surprisingly, the majority of accelerators offering corporate services are located in the world regions with the most developed startup ecosystems, such as San Francisco and New York

City in the United States, London in Europe¹³. We also analyzed 6 accelerators in Asia-Pacific states including China, Hong Kong, Japan, and India, and found that also accelerators in this region are evolving their business models towards offering more services to corporates¹⁴. Finally, we found that accelerators located in less well-developed entrepreneurial ecosystems such as Africa and South America have not yet shifted to new corporate partnership models, and are still mostly focused on offering educational services to startups. A possible explanation for this finding is that since accelerators' evolution is a very recent phenomenon that is now still undergoing globally, new corporate-oriented business models have been adopted first by the oldest accelerators that are located in mature ecosystems and have well-developed identities and business models in their regions, and have not yet reached the newest accelerators that are located in less developed regions of the world and are still in the process of developing their business model.

We contacted all accelerators included in the final sample through direct emails, and secured interviews with 17 of them. We conducted 24 interviews with members of these 17 accelerators, including key executive and corporate partnership managers. Four interviews were conducted face to face, while the others were conducted via Skype. Interviews lasted 48 minutes on average and were recorded and transcribed upon consent from our informants¹⁵. During interviews, we focused on corporate services and asked our interviewee questions about when and why their organizations started offering these services, how they work, what corporates usually ask them, what they think are the corporate goals behind each service offered, what is the level of involvement required to corporate partners, as well as what are the pitfalls they usually encounter. We also asked them what they think is distinctive of corporate services offered by accelerators as

¹³ Recent analyses about the state of entrepreneurial ecosystems and accelerators worldwide can be found, for instance, in the Genome Startup Ecosystem Report 2019 (available at: <https://startupgenome.com/reports/global-startup-ecosystem-report-2019>) and the 2016 Global Accelerator Report (available at: http://gust.com/accelerator_reports/2016/global/).

¹⁴ This finding is also confirmed by recent analyses of the evolution of accelerators worldwide (http://gust.com/accelerator_reports/2016/global/) as well as specific insights on accelerators trends in the Asia-Pacific region (e.g., Chakraberty, 2017)

¹⁵ Only one interview was not recorded and supplemented by rich notes.

opposed to, for instance, traditional innovation consulting. Coherently with the semi-structured nature of the interviews, we started from a list of question covering the main themes related to our research focus and adapted the questions to each interviewee's organization, as well as professional role and background. Whenever possible, we also asked our interviewee to share with us their commercial material and presentations. We also conducted 6 interviews with the corporate clients of these accelerators. We accessed these informants by asking the accelerators' managers to suggest corporate members from the organizations they had been running programs with. We then contacted them directly or through the accelerators' informants. Three interviews were conducted in person or via Skype, and three were conducted via e-mail. In this way, we were able to gain a thorough understanding of the spectrum of different services offered by business accelerators and collect examples and short stories related to specific projects. We continued to conduct interviews until no new insights and patterns emerged and we had thus reached theoretical saturation (Glaser & Strauss, 1967). We conducted a total of 30 interviews with 32 informants. The first author conducted all the interviews, listed in Table 1.

-----INSERT TABLE 1 ABOUT HERE-----

We complemented our interview data by collecting and analyzing archival data, including information and blog articles available on the accelerators' websites, commercial presentations, industry reports, and press news. In some cases, the organizations in our sample reported mini case studies on their websites or blogs, which we read and triangulated against our primary interview data. Whenever possible, we included in our analysis also presentations and documents collected directly from our informants. These complementary sources provided additional, objective information about the different corporate partnership opportunities presented by the organizations in our sample, as well as the different claims they make as for how they create value for their corporate clients.

We also engaged in opportunistic and flexible data collection (Eisenhardt, 1989) by taking advantage of different occasions to interact with experts in corporate services. For instance, the

first author participated to three academic-industry symposia about corporate accelerators, innovation ecosystems, and corporate entrepreneurship in two different universities (one in the UK and one in Italy) and in a private organization, during which she collected notes and engaged in informal, impromptu conversations with participants. We also followed the websites of the major accelerators in our sample, and read industry newsletters regularly. Table 2 summarizes the data collected for this study and their use in the analysis.

----INSERT TABLE 2 ABOUT HERE----

During this ongoing data collection, we repeatedly engaged in comparison among the different organizations in our sample, in order to identify emerging patterns and differences between the cases (Eisenhardt, 1989). This comparison included, for instance, listing services offered by each organization and testing different classifications. We stopped this ongoing, iterative process when we were able to clearly distinguish between different categories of services and classify them according to a scheme fitting our evidence. We organized our findings into a comparative table (Table 3). To validate our interpretations, we organized a meeting with two key informants and asked them to validate our preliminary findings and give us feedback (Yin, 2013). The analysis of our primary and secondary data allowed us to theoretically elaborate our findings in a typology of corporate innovation services provided by accelerators, which can be useful for scholars and practitioners. In the next section, we present our findings and theoretical elaboration.

FINDINGS

Our analysis of industry reports, business accelerators websites, and interviews with accelerators and corporate managers revealed four ways through which corporates can partner with accelerators to foster innovation or create relationships with start-ups. These are: i) *vertical acceleration programs (verticals)*; ii) *scouting services*; iii) *pilot experimentation programs (pilots)*; iv) *intrapreneurship programs*. These four solutions can be distinguished along two dimensions: the *innovation goals* they are designed to reach that can be specified or unspecified, and the *locus of innovation* they are designed to create that can be centred on the needs of individual firms or of networks of multiple

collaborating companies. Figure 2 illustrates the four engagement modes rooted in our case analysis. In the remaining of this section, we present the four engagement modes and provide concrete examples of each of them.

-----INSERT FIGURE 2 ABOUT HERE-----

1. Vertical acceleration programs

Vertical acceleration programs are cohort-based, limited duration acceleration programs aimed at developing start-ups focused on a specific technology (e.g., blockchain, or artificial intelligence) or industry (e.g., insurance, automotive, food, retail, entertainment, fashion, and so on). Though primarily aimed at developing start-ups, these programs can be very beneficial for corporate partners for they enable executives and other corporate members to be exposed to new ventures working in the same industry, sit alongside entrepreneurs, engage with start-ups through mentorship, and learn about innovative technologies, products and business models. These vertical acceleration programs are designed to attract and develop cutting-edge startup companies focused on a specific industry or technology vertical and connect these startups with incumbent firms operating in the same industry. These programs are perhaps the most renown and diffused engagement mode between established companies and business accelerators and are offered by world-famous accelerators such as TechStars and RG/A. Figure 3 portrays a typical vertical program timeline.

-----INSERT FIGURE 3 ABOUT HERE-----

Similarly to traditional acceleration programs (e.g., Cohen & Hochberg, 2014) startups get access by answering to a call from the accelerator, go through a structured selection process, enter the programs in cohorts, are offered educational and business development services for a fixed period of time, and finish the program with a demo day for investors and corporate partners. The accelerator's team takes care of selecting and nurturing the development of the startups for the duration of the program. Upon selection to participate in these programs, startups are usually offered seed investments from accelerators themselves as well as from the corporate partners.

These programs are designed to enable corporations to explore the forefront of specific industries or technologies in order to identify potential opportunities for corporate venturing or innovation.

As explained by one informant:

“Our startups most of the times fit in an industry vertical. Be it media, telecom, entertainment, it can be health, it can be logistics, it can be sports... we have nine verticals [...] corporates are very much interested, if you are a corporate in telecom for example, you are very much interested to be in a vertical to see what is going on in that area of telecom, what is coming up, what are the challenges and so on. A lot of corporates are very much interested in learning from startups where the market is going to, and in return they may offer their expertise, knowledge, and mentorship.” (accelerator senior business development manager)

Startup companies selection and requirements. Since the scope of these programs usually covers the length of a single industry value chain, startups are selected based on the extent to which their offering is consistent with the theme of the vertical. The scope of the selection is thus generally broad and based on entire industries or technologies that serve as overarching areas of interest for the corporates sponsoring the accelerator program, which is open to a variety of different solutions. In the case of an accelerator that we interviewed, for instance, an employee told us:

“Generally it’s broad ... right now, for instance, with [one of our corporate partner], it’s just FinTech, period. So if you’re innovating within FinTech, like no matter what it is, if it’s on the payments side, B2B, B2C... we’re accepting it.” (accelerator employee)

Generally, there are no specific minimum requirements in terms of startups maturity. This means that these verticals are usually open to both startups that are still in the conceptualization phase as well as more advanced startups that already have a minimum viable product. The selection is generally made by the accelerator team, sometimes with the participation of the corporate partners, to allow the corporate partners to have a wide spectrum of potential opportunity areas.

“It’s mainly we’re selecting, sometimes the companies will have a say in it, but generally we’re putting this through our interview process.” (ID7, accelerator employee)

The selection of startups can be more or less restrictive. In the case of the most prestigious programs (such as, for instance, TechStars accelerators) it can be difficult for startups to get in. As told by our informants, these programs usually accept between 8 and 16 startups per batch out of global open calls that can reach between 150 and 500 applications.

Corporate goals. Vertical acceleration programs can be valuable vehicles for corporates looking for ideas as for how they could innovate their business to explore different technology solutions and get into contact with high-potential startup companies, without investing the same amount of time and resources that would be required to set up a corporate accelerator internally. Because vertical programs enable corporations to have a window into emerging technologies, products, and business models that are relevant for their industry, and sit alongside entrepreneurs while mentoring them, these programs can be valuable means through which corporates get ideas as for how their business could be rejuvenated, find out with startups potential synergies and technology integration opportunities, and in some cases even think of investing in those startups through corporate venturing. As a program manager of a vertical acceleration program focused on the insurance industry explained, for instance:

“For some reasons, the insurance market has stayed fairly old fashioned. So a lot of business is still done by paper. They haven't used, you know, modern technology. So a lot of the work they do is still based on Excel spreadsheets and it's massively inefficient and really, really expensive [...] which is why at this point in time it's an area that they merge and innovate upon, because unless they start changing the way that they function, the cost of doing business is very expensive. So that's something that at the moment they're trying to figure out – how they can break down that cost, a lot of which has got to do with, you know, if they could use better tools and have better techniques that they use. So this is exactly what we do. We identify the products that can really help, and [...] pick the companies that they think will create the most change.”
(accelerator program manager)

Another informant who manages a vertical acceleration program in the construction industry echoed: *“the construction and real estate industry is a very traditional kind of business, which has not been so innovative in the past but which is really in the need of reinventing its technologies, its business models, and so on. There is a very high boost in innovation in this area. That's why we have launched a start-up accelerator [...] the startups don't pay anything to join the accelerator, we are fully funded by our corporate partners through an*

annual membership fee that covers all the costs of the program, and for that fee, they are invited four times a year to take part to the selection committees, which is the moment where we present new startups to the corporates and they are allowed to select the startups they want us to work with.” (accelerator director) Similarly, another informant said: *“by being in the ecosystem, you are a kind of observer. You take your moment when you think your moment is there, and if you see indeed that there’s an interesting startup that maybe can help you with a challenge, you can reach out [...] the main goal is indeed collaboration together and inspiring together.”* (accelerator senior business development manager)

Corporates that support and enter these programs get access to accelerator’s networks well beyond the startups’ cohorts. TechStars, for instance, provides to its corporate partners access to a worldwide network of more than 10 thousands mentors, startup founders, and investors¹⁶. As one corporate informant explained:

“One thing we realized about innovation, and about the startup world, is that there are the established partners like incubators and accelerators, but then also everyone that gravitates around incubators and accelerators, like experts, universities... there’s a whole world around them that is useful.” (corporate manager)

Corporate involvement. We found some variance in the level of commitment required to corporate partners in verticals. Some accelerators require only financial sponsorship and no mandatory participation in the accelerator activities except participation to the startups selection committees and demo days. Others require intense commitment and involvement from the corporate partners, in order to leverage on close interactions between the participating startups and the corporate employees involved as mentors. TechStars, for instance, requires all companies partnering with them to send over a relatively large number of corporate mentors in the program to help the selected startups.

“A lot of companies can put three millions dollars, but not a lot of companies can provide 15 to 20 mentors [...] So if we don’t have a hundred per cent from the corporation, we don’t do it.” (ID7, accelerator employee)

¹⁶ <https://www.techstars.com/corporate-innovation-partnerships/>, accessed May 18, 2019

Overall, the accelerators that we interviewed consistently agreed that the success of these programs highly depends upon the level of corporates involvement. If corporates are mere financial sponsors but are not involved in the accelerator's activities, their learning returns on investment are likely to be very limited, and startups are likely to get easily frustrated by the lack of commitment and knowledge sharing with the sponsoring corporates.

“We believe mentorship to be a two-way stream, that creates a relationship in which both [corporates] and startups drive. When [corporates] partner with TechStars, [they] hand-take the startups that will support [their] innovation strategy and objectives. Working shoulder to shoulder, [the corporate] will see the future of [its] industry through the lens of an innovative startup. This approach enables [corporates] to inject startups energy and innovation in [their] culture.” ([TechStars website](#), accessed May 18, 2019)

As running a vertical acceleration program can be a significant monetary investment for a company, many verticals are sponsored by multiple corporate partners at the same time in order to split the cost between many organizations.

Examples.

Vertical programs are designed to allow corporate partners to actively shape the future of their industry by supporting the development of innovative ideas and high-growth companies, while at the same serving as bridges for corporations to connect with potentially interesting startups. These programs are thus well-suited to explore a broad spectrum of potential solutions provided by startup companies, and are especially useful for corporates working in traditional industries looking for ideas as for how they could bring innovation into their business. Because the structure of these programs is essentially that of a standard startups-focused acceleration program (Cohen, Fehder, Hochberg, & Murray, 2019; Cohen, Bingham, & Hallen, 2018), they are cohort-based and time-limited, and culminate with a demo day during which the startups present the progress they have been made during the program to the corporate sponsors and investors.

In Europe, we found interesting vertical programs run by accelerations such as GenerationS in Russia and Beta-I in Portugal. In Asia-Pacific, vertical acceleration programs are offered by, for

instance, India Accelerator, the Tokyo-based 01Booster accelerator, the Singapore-based accelerator ImpacTech, the Shanghai-based Chinaccelerator, and the Bangkok-based accelerators RISE and Nest¹⁷ in Thailand. In Africa, Founders Factory has recently launched a vertical acceleration program for startups working in FinTech, health, retail, energy, transportation, and education¹⁸. In the US, TechStars mentorship-driven corporate accelerators and RG/A Venture Studios are prominent examples of successful business accelerators running industry verticals across a variety of sectors. TechStars has designed and ran corporate-sponsored verticals focused on industries as varied as Voice Powered Technology, Internet of Things, FinTech, Connectivity Media and Entertainment, Healthcare, Artificial Intelligence, Retail, and Mobility. Similarly, RG/A has partnered with companies across industry verticals ranging from connected commerce, to sport, petcare, and hospitality¹⁹.

In all cases, startups are selected by a jury of corporates' and accelerators' members as well as industry expert (according to the theme of the vertical) and go through a 10 to 16 weeks program in during which the entrepreneurs are mentored by corporate executives and employees, and validate and test the relevance of their ideas against the industry on which the vertical is focused. They benefit from mentorship and support from both the accelerator and the corporate partners' teams, educational and business development initiatives such as workshops and networking events, and financial investments. In the case of RG/A IoT Venture Studio in London (UK), for instance, RG/A leverages on its internal pool of talents in subjects such as strategic marketing, communication, and design to work closely with the startups and help them succeed; selected companies also get the chance to access the corporate partners network and discuss potential business relations and pilot collaborations. Similarly, TechStars has a strong focus on mentorship during its programs, and has strict requirements for its corporate partners in terms of active

¹⁷ <https://www.nest.vc/agrowth>

¹⁸ <https://foundersfactory.com/africa/program>

¹⁹ source: <https://ventures.rga.com>

participation in the program's activities. After the program, the corporate partners can choose to continue to work with the startups that participated to the program and integrate their proposition in their business through specific pilots, or to take an equity position or invest in them. As the director for product and technology Innovations of a leading pulp and paper corporate working with GenerationS in St. Petersburg explained, for instance:

“The main purpose of the program was to find technologies, solutions, partners and startups to fit our innovation strategy directions [...] like new bioplastics compounds from cellulose, biocomposites, organic compounds and pharma products from wood, new types of paper and paperboard and also digital solutions. The accelerator is one of the instruments to find the answers to these questions, and it was a great approach to collect technology and solutions that are already on the market and to understand the “state of the art” in concrete technological niches. We successfully collected more than 150 startups and solutions and incorporated them into our innovation funnel. Then after a long deep-dive study and assessment we selected 15 winners and started to develop ideas with these startups teams, several of which are already close to pilot and implementation at the moment.”

To sum up, accelerators offer vertical programs to corporates interested in exploring a potentially wide range of innovative ideas and evaluating opportunities for collaborative innovation or corporate venturing within a whole technology or industry value chains. Through a combination of mentorship activities as well as collaborative workshops and events, corporate partners involved in industry verticals get exposed to innovative ideas and connect with both new ventures and industry fellows operating in the same market or addressing the same technology interests.

2. Pilot experimentation programs

Pilot programs are limited duration programs focused on bringing together corporate partners and start-ups that are relevant for their business to solve specific corporate challenges, quickly develop and test technology integration opportunities, and develop new products and services. Differently from verticals, these programs are targeted and designed to solve specific corporate innovation needs that have to be defined before the call for applications and upon which startups are then evaluated to enter the program. They are thus an alternative path through which accelerators help corporates innovate by enabling them to co-create new products and services or explore concrete technology integration by working collaboratively with industry fellows and

startups. Figure 4 portrays a typical pilot program timeline.

-----INSERT FIGURE 4 ABOUT HERE-----

Differently from vertical programs – where ideas and opportunities for technology integration may emerge during or after the program – these programs are designed around specific innovation needs of the participating corporates that are defined before the start of the program.

As one informant explained, for instance:

“We had a program that we ran very recently involving [an established firm] in financial services in the US. They needed to automate a lot of the credit approval process in their business. That’s a very specific challenge just to their business. So we found companies that suited that challenge, that could deliver that sort of service, and could develop a new product for financial services.” (accelerator head of development)

Even if these programs are usually time-limited and cohort-based, their duration as well as the interactions between the participating corporates and the startups are structured around the development of experimental collaborative projects – i.e., the “*use case*” or “*pilot*” designed to co-create an innovative solution in response to a challenge posed by the corporate partner. Each participating corporate is matched with one or more startups, with which these pilots are then developed over a few weeks or months. The content of the pilots as well as the corporate-startup matches are defined prior to the beginning of the program, and developed throughout its duration with ongoing support from the accelerator, who orchestrates the activities to be done as well as their timing. The aim of these programs is usually to use the pilot as a mean to test experimental collaboration, and – if the experiment succeeds – transform them into enduring partnerships. The number of corporate-startup collaborations initiated during and after the program is often used as a success metric. As one informant explained:

“We feel that we are different from traditional accelerators in that we are focused on challenges that have been posed by senior members of a corporate business. So part of [our role] is [...] to essentially act as an integration product manager to help the startups push their trial on that product and the development of that product into a corporate business, as well as provide advice to the startups on how they can develop that product further. And that may include pivoting the business, it might include switching transactional model, it may include lots of different aspects of their company.” (accelerator head of development)

Startup companies selection and requirements. Because the main objective of these programs is to enable co-creation of innovative solutions through pilots, they usually do not entail seed or corporate investments in the participating ventures. As one informant explained: “*Basically what we do here, is we matchmake corporations with startup [...] What we are really focusing on here, is helping startups accelerate their business development.*” (accelerator manager) To participate in these programs, the startups’ offering must be aligned with the specific requirements of the corporate partner, which are identified jointly by the accelerator and the corporate partners before the program starts. Corporates generally have decision-making power over the participation requirements for startups, participate in the actual selection, and co-design with the accelerator and the startups the activities to be carried out during the program. As explained by one informant: “[*Corporates*] *select them [...] in general, the startups are selected with the needs of the corporate in mind.*” (accelerator manager) Because the participating startups must have the operational capacity to run a pilot with large established firms, very early-stage ventures are usually excluded. One corporate informant explained this rationale: “*Some functions have global inefficiencies, so the startups cannot be small. Because then if you decide to work with them and they are not able to work with you globally, you cannot go any further.*” (corporate manager) Depending on the specific activities to be done during the pilots as well as the frequency of corporate-startup interactions required to do the pilots, these programs can entail either co-location of the startups at the accelerator’s or the corporates’ facilities for the whole duration of the program, or virtual participation and presence in person only during some specific events such as the program kick-off or the final demo day.

Corporate goals. Pilot programs are primarily aimed at solving specific corporate innovation challenges through collaboration with (usually tech-focused) startups. Because they are often multi-partner – that is, they involve multiple corporates and startups simultaneously working one or more use cases for a limited period of time – the corporates and startups that participate in them can thus benefit from the formation of temporary communities of firms of different age and size operating in similar industries or with similar technology interests, and can learn from each

other what their industry fellows are doing and share best practices and common pitfalls. As a manager of an energy utility companies who participated in a multi-partner global program said during a speech²⁰:

“[The program] gives us the opportunity to look at what’s happening in our industry from a global perspective, and it also gives us the ability to work with quite innovative startups and to deal with other utilities who are facing similar challenges in different geographies.” (corporate manager, utility company)

Other managers whose company participated in the same program echoed: “*the ability to compare the way we are coping with challenges with other utilities who are having similar but different challenges is a great opportunity for us.*” (corporate manager, utility company) and further: “*I think that this is a tremendous opportunity for mutual discovery and also business development.*”

Because the pilots are short-term collaboration aimed at testing opportunities for technology integration or co-creation of new products and services, these programs offer controlled environments in which incumbents can create product or process innovations through experimenting with startups, and learn from and with them. They are usually not used as vehicles for corporate venturing. As explained by one informant:

“I think that our value added here is, first of all, all of our open innovation programs are multi-partners. Which means that the corporate is looking to engage with the startups, but also with other corporates. [...] it’s really important for the corporate to also have access to a ‘safe place’, I would say. They come to [the accelerator], they know it’s not part of their daily job, and they come to a safe environment to talk to [other companies] that may be competitors in real life. But here, because of the purpose of the open innovation program, they know that they can collaborate and find a different way to work together.” (accelerator program designer)

Furthermore, both corporates and startups benefit from the support from the accelerator team during the pilots’ execution, who monitors the collaboration and makes sure that “*they keep on track [and] that the conversation is going somewhere.*” (accelerator manager) As our informants explained, this support is particularly critical to align corporates’ and startups’ orientation towards time (corporates are usually much slower than new ventures), to ensure that startups get access to

²⁰ <https://www.youtube.com/watch?v=drXsDxFXVT0>

the relevant corporate data they need to execute the pilots and help them negotiate the contractual agreement that regulates the terms of their collaboration. One informant, for instance, explained:

“We monitor all of the startups activity throughout the program, we provide feedback to the corporate, we provide feedback to the sponsors of the corporates, as well as the startups, and keep them all addressed that progress has been made on both sides. And the real role for us [is] also to make sure that the quality and the relevancy of the use cases is still there for the corporate partners. So it may well be that during the program we may advise the corporate to switch use cases with that startup, we may say ‘you should think about doing something else’, ‘you should probably look at doing something different’, and then we give them advices on how they should do that.” (accelerator head of development)

Corporate involvement. Because the successful development of the pilots depends on the quality of interaction between the participating firms’ managers and employees and the startups’ teams, the level of involvement required to the corporate partners is generally high. Accelerators running these programs usually require the involvement of senior managers (such as, for instance, the Chief Innovation Officer) to act as internal champions for operational managers and employees, in order to make sure that they will devote time and share knowledge and information with the startups involved. As explained by one informant: “*it’s not just the director of innovation, or CDO, or the head of digital innovation or whatever ... we also work with operational people here.*” (accelerator manager). Another echoed:

“For a corporation to become a partner with us, they have to have a specific structure internally, they have to be keen to work with startups. So they have to have a champion, they have to have the CIO involved, but not just the top, there needs to be involvement of the bottom as well. So we work directly with the business units as well.” (accelerator manager)

Such a high level of involvement is necessary to ensure smooth execution of the pilots and the realization of mutual gains for both corporates and startups. Concretely, this involvement entails participating in the startups selection, sharing internal data and information to startups while working on the pilots, scheduling frequent meetings and calls with both startups and accelerator’s team to check the progress, actively working with the startups to test the pilot results, and attending the program’s most important events such as the program kick-off and final events or demo day.

“We demand that these things are in place, because a program without this sort of dedication and commitment from a senior leadership is not going to succeed, because you don’t get results out of the program if the senior people aren’t there to help push things in the business, unlock barriers, be able to make sure that people are aware that this is an important process for us that we must focus on.” (accelerator head of development)

Examples.

Pilot programs are becoming more and more common across all the accelerators that we have analyzed. In the US, Plug & Play Tech Center and RocketSpace – both Silicon Valley-based innovation centers with a global reach – are prominent examples of companies that, after many years of running successful accelerator programs across different industries worldwide, have now centered their model around corporate innovation by acting as a bridge between corporations and startups. Through their global networks of startups, investors, and corporate partners, these accelerators offer pilot programs across a variety of different industries. Since 2010, Plug & Play has been offering corporate innovation programs spanning high-tech industries such as FinTech, InsurTech, IoT, and Mobility, as well as more traditional low-tech sectors such as Brand and Retail, Food and Beverage, and Fashion²¹. Similarly, RocketSpace offers pilot-focused Industry Collaboratives which entail participation of multiple corporate partners in, for instance, Mobility Tech and Food and Agriculture²².

In Europe, examples include GenerationS’ program with Michelin focused on solutions to enhance the comfort of trucks’ drivers²³, NUMA’s programs aimed at testing specific solutions for challenges related to urban mobility²⁴ and smart cities²⁵, Beta-i programs on health with Novartis, on Fintech with SIBS and on energy with a global group of 10 utility companies, LMarks W2 innovation program focused on Wincanton’s (a leading British logistics company) specific challenges related to, for instance, asset utilization and excess transport capacity and warehouse

²¹ <https://www.plugandplaytechcenter.com/corporations/>

²² <https://www.rocketpace.com/accelerators/startups>

²³ <https://www.rvc.ru/en/press-service/news/company/146076/>

²⁴ <https://citymakers.io>

²⁵ <https://www.datacity.numa.co>

space. In Asia, RISE Accelerator has done pilot programs focused on artificial intelligence and banking. As stated in their website, “RISE.AI [is the] Southeast Asia’s First Corporate AI Accelerator program that will bring in 30 best-in-class A.I. startups from best-in-class A.I. startups from Asia and work intensively with Southeast Asian corporates for 9 weeks [...] focusing on delivering real tangible business results by plugging startups solutions to our corporate partners’ problem statements, rather than incubating startups.”²⁶

In all cases, these programs entail a preliminary stage during which the accelerator works closely with the corporate partners to pinpoint specific technology and innovation needs from the corporate business units that the participating startups are called to solve, and which are summarized in a *brief* or a *problem statement* document. After this assessment phase, the accelerator team actively scouts for startups that meet the requirements of the corporate partners and, together with the corporate team, selects the best matches. The program design and the activities to be done over its duration vary according to the specific use cases on which the startups and corporates will work. The activities are thus customized on a one-to-one basis, and are outlined in a pilot roadmap that defines the scope of the pilot as well as the contractual agreement between each pair of collaborating corporates and startups. This can entail, for instance, relocation of the startups to the accelerator’s facilities as well as in the corporates’ offices, depending on the specific pilots and activities that have to be done. Over the program duration, the accelerator’s team monitors the development of the pilot, facilitates the communication between the startups and the corporates, and sometimes provides startups with additional training about the corporate’s business or specific operations. These programs generally finish when the results of the pilots are ready to be showcased to the corporate partners, after which the participating organizations decide whether and how they want to initiate enduring partnerships. Because the overall goal of these programs is to allow the corporate clients and the startups to co-create innovations through experimental projects under the constant monitoring and assistance of experienced people from the accelerator

²⁶ <https://riseaccel.com/accelerator/>

team, they are valuable vehicles for corporates to pinpoint specific innovation needs, co-develop innovations, and learn how to best interact and work with young ventures. As explained by a corporate informant at working at Michelin:

“The first objective was definitely to hunt for technologies and services that can supplement our truck offering, with specific regards to the safety and comfort of the long distance truck drivers. The first objective was hit in the sense that our truck organization in Russia found a match with a startup to run a PoC. Besides this success, we learnt a lot about the way things should be done in all phases. For instance in the preparation phase it is paramount to have a clear mandate [...] the briefs with the partner are very important to set the objectives, the methodology and the KPIs. This is when the trust is built between the parties. And then in the program, ongoing communication is key for the success, but each party needs to know their own boundaries. Keep things simple and pragmatic.”

Another corporate informant echoed: *“We have learnt a lot of blocking points – so if I were to start again with another startup, I know I would be much readier, I would have a lot of questions like ‘can you do this, can you do that’, I’d know exactly what to ask.”*

3. Scouting

Through scouting services, accelerators search for startups developing innovative solutions, technologies and business models that can be applied to a corporate partner’s business and organizational processes on the basis of a co-designed brief. The aim is to help corporate partners evaluate possible follow-up opportunities for collaboration with startups, without committing to participate in a program. The aim is to help corporate partners evaluate possible follow-up opportunities selected startups. Differently from verticals and pilots, scouting services do not involve a call for startup applications as startups are not involved in the search phase, and they do not involve a structured program after the search for startups is completed. Figure 5 portrays a typical scouting timeline.

-----INSERT FIGURE 5 ABOUT HERE-----

These services are one-on-one collaborations between individual corporates and accelerators through which a dedicated team from the accelerator searches for startup companies that may be of interest for the corporate client on its behalf, to produce a shortlist of potential collaborators in some pre-defined (usually broad) opportunity areas. These services entail a

preliminary phase of assessment of the corporate client's technology interest and overall strategy, to produce a list of search criteria on which the scouting is then based. The accelerator team then performs an open search for potentially relevant startups, usually exploiting both its proprietary network of partners, entrepreneurs and alumni, as well as through specialized databases such as Crunchbase or AngelList, organize information about the startups in a detailed database, evaluate and score each venture's relevance to the corporate partner, and finally create a shortlist of potential collaborators who are usually presented to the client during a dedicated event. During the whole process of scouting and selection, startups are usually never involved nor aware that they have been pre-selected and presented to the corporate. In some cases, these programs culminate with a pitch event during which startups are called to do a formal presentation to the corporate client, after which they are left entirely free to decide whether they want to continue their relationship (for instance, with a pilot) or not. In other cases, the database and scouting report are sold to the corporate without any pitch from the startups. Although the accelerator's team can be involved if the corporate client decides to go ahead and initiate a collaboration with one or more startups, there is no structured program behind it, and each collaboration is managed independently. As explained by one informant:

“Once the corporate has done the final selection [the startups] go and see the corporate, and we organize that. It is one morning or afternoon when they have half an hour, let's say fifteen minutes pitch, fifteen minutes questions and answers, and ideally there is a follow up after that that says 'ok, this is interesting, I like it, I want to see them back.' And from that moment they do a one to one meeting, and we are not there anymore. It's between the startup, or the scale-up, and the corporate.” (accelerator senior business development manager)

Startup companies selection and requirements. Because these services entail open scouting for the largest possible number of startups, the scope of it is usually quite broad and includes all startups that fit the search criteria defined during the initial assessment between the accelerator and the corporate. These may include, for instance, only startups within a specific country or part of the world, that have reached a minimum development stage, or that work within a precise technology or industry segment. This initial joint assessment of the scouting criteria,

which is generally formalized in a scouting brief, is critical to orient the subsequent search and thus to maximize the effectiveness of these services. In any case, these briefs are usually quite broad in order to maximize the scouting reach. As one informant at a fashion-focused accelerator recalled, for instance: *“With [a corporate client], we did two scouting rounds. The first was on product tracking technologies and the second was on human-machine interaction technologies [...] both briefs were very broad.”* (accelerator scouting specialist) Another working in the construction industry echoed: *“it’s open, the thing they say is ‘we know we have an issue in the digital fabrication and 3D printing, and we want to learn about that.’ And that’s all, that’s all for the brief.”* (accelerator associate) If there is a pitch day at the end of the scouting, startups are selected based on the corporate audience’s evaluation of its relevance and fit with the incumbent technology needs or overall strategy. The startups’ presentations, therefore, are usually focused on the relevance of their solution to the corporate. Usually, the accelerator’s team provides guidance and support to the selected startups and to frame their arguments in order to help the corporate audience envision which potential collaboration opportunities may exist. As explained by one informant: *“they make a kind of tailored-made pitch, based on the corporate’s innovation challenges.”* Another echoed: *“If your audience is made of investors, you have to explain to them how you make money. If it’s a company, you have to explain what you do and how you guys may work together [...] they want to know why they should be interested in what you do ... they want to know if your offer is interesting for them.”* (accelerator scouting specialist) One associate at a European accelerator in the construction industry explained:

“Sometimes there is no obvious reason why a corporate and a startup should work together, but we try to help them explore if there are possible opportunities, even if sometimes these opportunities are not short term and even if these opportunities are not obvious. It’s part of what we do for the corporates to help them to identify potential avenues for future collaboration for every startup that populates the ecosystem – then of course is up to them if they want to go ahead or not.”

Even though early-stage startups are not automatically left out of the scouting, the startups selected to do the pitch should be ready to start a pilot right after, and thus should have at least a viable minimum product. Because there is no structured program after the scouting, startups are not relocated, and their participation (if any) is mostly virtual.

Corporate goals. Scouting services serve as funnels (Prashantham, 2019) through which corporates search for opportunities in their external environment and assess potential collaborations with startups. Through scouting services, incumbent firms can have a window into a wide range of potentially relevant technologies and businesses, connect with multiple startups, and evaluate potential collaborations without committing themselves to financially sponsoring and actively participating to months-long programs. Because these services entail an initial joint assessment of the corporate's strategy and potential innovation needs, by participating in them the corporate managers have the chance to reflect on the firm's strategic objectives and agenda, prioritize their technology interests, and commission a bespoke search. As one informant explained: *“what we are doing for those businesses is helping them with their innovation agenda, predominantly through interactions ... it is a lot more than just the introduction, it starts from [...] understanding what the key priorities are at the moment, and aligning [the startups'] innovations to those priorities.”* (startup innovation consultancy company director) Rather than engaging in exploratory search themselves, corporates can thus benefit from accelerators' skills, distinctive knowledge, and network positioning, and reach a wider variety of potential collaborators and opportunities for innovation. One informant echoed:

“That's really what we aim to do, we aim to provide that experience to the corporate, not the experience of their industry. Because they're the experts in their industry, and we don't pretend to be otherwise. We use their expertise, and show our expertise to help them.” (accelerator head of development)

Furthermore, the pitch day can be used as inspirational event for corporate employees to allow them to get out from their daily jobs, be exposed to innovative ideas, and envision opportunities for innovation which may be difficult to identify otherwise. As one informant at a corporate explained: *“it is like getting out from your routine, go there and see, being projected into the future... and this triggers a reaction.”* (corporate manager)

Corporate involvement. Corporates are involved during the initial assessment phase, during the scouting results presentation, and at the pitch day (if any). The actual scouting is

performed by the accelerator's team, with little or no involvement by corporates. As explained by one informant:

“There's no program, there's no acceleration, is purely focused on utilizing our large scouting network, and getting the benefits from the impact of that.” (accelerator head of development)

Examples.

Several accelerators offer scouting services. In Europe, for instance, Imec.istart, a Belgian innovation centre running several vertical accelerator programs for startups across a variety of industries, for example, has a dedicated package of ‘smart brokerage’ services for corporates interested in exploring potentially relevant business opportunities with startups²⁷, both within and outside the centre's existing portfolio. Similarly, the British accelerator LMarks offers ‘discovery services’ aimed at supporting manager in disentangling their strategic resources and globally scout startups that are relevant to those opportunities areas. In Italy, the digital hub H-Farm has run several scouting projects in various industries such as fashion, retail consumer goods, and healthcare. In Asia and the Middle East, Nest offers custom sourcing services aimed at discovering startups that may provide solutions for individual organizations or other corporate accelerators²⁸.

Scouting services can be offered either as ad-hoc initiatives for individual companies or business units or as enduring partnerships between the corporate and the accelerator entailing multiple rounds of scouting across the year. In the first case, the corporate can access the accelerator to perform a strategic scouting on a target business challenge; in the second case, the partnership is configured as a continuous search for potential partners aimed at sustaining the company's innovation endeavours in several opportunity areas. As one informant explained:

“We have some big programs that follow more of an always-on style, and that is essentially a constant scouting for various challenges that are relevant to corporates and what they are looking for... so they can find lots and lots of companies and focus on certain challenges at a time, whatever these might be. Essentially the attention is to try and create a wider level of engagement with the startup community

²⁷ <https://www.imec-int.com/en/istart/corporate-partner>, accessed May 20, 2019

²⁸ See, for instance, https://2cedb244-525e-409a-8320-9f1fe255c6d1.filesusr.com/ugd/f6fcce_707fcb35bd7464ea9d7b79ea1b07a34.pdf

throughout an entire 12 months period, rather than just one sort of short, and very highly focused period of development as the normal programs are.” (accelerator head of development)

Depending on each corporate’s specific needs, scouting services can be offered as a stand-alone product or in combination with other services, such as consultancy on cultural transformation or on innovation strategy. Through these partnerships, corporates can access accelerators’ scouting expertise and access to a global network of startups as well as proprietary databases. In this way, they can explore innovation opportunities potentially relevant for their business, increase the flow of novel ideas towards the involved teams, and generally nurture a collaborative approach to innovation. Scouting services can thus be thought as agile exploration devices through which corporate managers can select the most suitable solutions according to their current and prospect needs, and subsequently evaluate technology integration, investments, or commercial deals without committing to enacting a pilot immediately after the selection. As explained by an employee of a leading luxury company working with H-Farm on a global scouting project:

“The assessment that we did with H-Farm was quite different from what we normally do when we look for vendors because they brought us ideas that we didn’t think before. So we gave them some broad areas we were interested in, they searched for startups, and as they presented those startups to the people that attended the selection day they enabled them to come up with new ideas. So I’d say it’s the reverse of what we normally go through – usually we identify a need, and then select a provider. With H-Farm it was more inspirational, they brought a list of providers to inspire us and then we thought about what we could do with them, together.”

4. Intrapreneurship programs

Finally, accelerators can help companies foster innovation internally through intrapreneurship programs aimed at developing employees’ ideas, transferring skills and methods that can help corporate grow new businesses internally, sharing the same resources that are used to train start-ups (such as training programs, co-working spaces, and startup mentors) with corporate employees, or connecting them with entrepreneurs and start-ups that can help them pursue entrepreneurial efforts. Because intrapreneurship programs are aimed at nurturing

entrepreneurship within corporations, these programs do not usually involve collaborations with startups. These programs are particularly germane for incumbent firms willing to pursue growth strategies by creating new businesses, whose managers and employees need extra time, resources, or specific expertise to develop potentially valuable ideas or incumbents who want to pursue innovation strategies by outdating internal processes and fostering managers' and employees' entrepreneurial orientation and behaviours. Figure 6 portrays a typical intrapreneurship program timeline.

-----INSERT FIGURE 6 ABOUT HERE-----

In these programs, accelerators sponsor corporate managers' and employees' entrepreneurial initiatives, providing resources such as training, facilities, or connections with entrepreneurs to them in order to help them develop ideas into new businesses or create internal corporate ventures. Through intrapreneurship programs, accelerators put their distinctive skills and expertise in developing ideas into successful businesses as well as their knowledge of the entrepreneurial context and distinctive network positioning at the service of incumbent firms' corporate entrepreneurship initiatives, by for instance hosting corporate teams into their programs and treating them as if they were independent startups. As one informant explained:

“These activities are mostly focused on training, and talents development within corporations [...] so here the impact is really on the culture, so really helping the corporates to speed up their go to market and to put on the market new, innovative services more quickly. So here we really focus on the product, using lean methodologies, which means we can run some intrapreneurship programs during which we take a team of five people that will come to [the accelerator] two days per week, and during these two days a week they will run some sprints, during which they will work very quickly on launching a new product, so testing the need, testing the feasibility, and testing the market, at how much they can sell it, what is the size of the market, etcetera. We train the corporates to work at the pace of the startups, to use the methods of the startups.” (accelerator program designer)

Startup companies selection and requirements. Startups are usually not involved in these programs. Interestingly, while in traditional accelerator programs corporate members offer mentorship and training to entrepreneurs, in intrapreneurship programs this relationship is reversed. Entrepreneurs are often called to mentor corporate employees in order to help them

learn alternative ways of working and encourage them to develop ideas for new products, services, or operational processes and method. This can happen by, for instance, relocating a corporate team within an existing accelerator or incubator in order for people to take some time off from their daily work, develop different projects, and experience the same training and mentoring services that are offered to startup companies that take part in these programs. One informant explained:

“All the trainings that we do are inspired from the methods that we use with startup acceleration. And in most of the trainings, we also have a pitch from the startups. So they are still involved, but the outcome that we expect is not a startup, it’s really focused on changing the methodologies.” (accelerator program designer)

Alternatively, accelerators can organize specific events (such as hackathons) for corporate members, to train them to think about innovative solutions quickly and design concrete implementation plans within a compressed period. Sometimes, accelerators create and develop internal corporate ventures (that is, new ventures created within the boundaries of the firm) in a technology or expertise domain that is different from that of the corporate client. In these cases, the accelerator team is in charge of selecting the venture’s team, host it within its facilities, and support its growth. One informant explained this process:

“Last year we had a big project to work on the IT system of a large pharmaceutical company, and they didn’t have any developers in the teams, and they didn’t have anyone who was an expert in data analytics, and so we as part of the team that was coaching the entrepreneurs we had a developer working one day per week on the project, and we had a guy who was an expert on growth hacking that was also working one day per week on the project. So we went out and scouted some skills that the corporate didn’t have, and they needed them to work on this internal project and to develop a new product.” (ID5, accelerator program designer)

Corporate goals. Intrapreneurship programs have two main goals for corporates. First, through these programs corporate employees can benefit from the same methods and training that are usually applied to help startups develop their businesses, and apply those techniques to their daily job. Due to their distinctive knowledge and expertise, accelerators are valuable learning vehicles for corporates interested in fostering entrepreneurial capabilities within their boundaries by encouraging employees to develop innovative ideas and grow new businesses. By being exposed

to entrepreneurs and other actors within entrepreneurial ecosystems, these programs can facilitate corporate entrepreneurship activities by acting on managers' and employees' cultural schema with the aim of prompting entrepreneurial behaviors – for instance, facilitating their orientation towards experimentation and trial-and-error learning, as well as their orientation towards risk and speed. Second, employees willing to develop new ideas can take advantage of structured accelerator programs to spend time developing those ideas in a stimulating environment far from their daily duties. Similarly to what is usually done with startups and leveraging on the same methods, accelerators help corporates filter ideas, judge their quality and relevance, and advance those with the highest growth potential. As one informant explained: “*We work with clients to help them understand how to assess the value of the idea, and then they can benchmark or compare ideas as a result of that. So we help them come up with a way to evaluate ideas to determine which ones are the most valuable.*” (accelerator director)

Because through these programs corporates can involve employees from all functions in the ideation of new products and businesses, or in new ways through which some processes can be modernized, intrapreneurship programs can be valuable vehicles for established firms to find ideas for strategic renewal or to create innovations and internal ventures through the involvement of employees at different levels or located in different regions of the world. As the program manager of an innovation program run by a Japanese conglomerate explained, for instance:

“When we asked for feedback at the end of the program, we got some really valuable and positive insights [...] for example, teams in Africa saying that they would never normally get the chance to submit their ideas and put their ideas forward for new businesses in their kind of business as usual. So having a project like this is really great for them to be able to submit ideas and push ideas forward, which is exactly why we do this program, you know, to give people out in the regions and people that maybe haven't had a voice up until now them the chance to have a voice. And if you've got a great idea, it doesn't matter where you are, what business unit you work for, what level of the company you are. You can submit your idea and you get equal opportunities as a general manager does.”

Corporate involvement. Since intrapreneurship programs are focused on creating and developing innovative projects or internal corporate ventures, they usually require active participation from corporate members at different levels, and sometimes relocation in the accelerator's facilities for the time needed to develop the projects. Employees need time to work

on their ideas actively. Thus, their managers need to be ready to invest part of the working time of these people in letting them participate in development or coaching sessions or relocate them to a different office. As these programs are totally customized around the needs and goals of each individual corporate, accelerators work closely with corporate teams during the program design phase and engage in frequent interactions with the corporate teams. One informant described how these programs are different from innovation consultancy in this way:

“I think the difference from us is that we come in, we give you options rather than recommendations, and then we can stay with you during the implementation to make sure that you’re able to get the benefits of what you’re trying to accomplish. I think the difference is the depth of engagement, and then the length of engagement. And then I think also the philosophy. You know, consultants don’t engage in the outcomes of their clients. In our case, when we work with innovation companies, we’re engaged in the outcomes. So we’re not consultants, we’re trusted advisors.” (accelerator director)

Examples.

Compared to the other engagement modes, intrapreneurship programs are more customized around each specific corporate’s needs. Due to such greater customization, we found a variety of different options and a wide array of services that qualify as part of this segment. These programs may vary from a relatively superficial assessment of the corporate orientation towards innovation and internal entrepreneurship that is done by the accelerator’s team over the course of a few weeks, to corporate workshops hosted at accelerators facilities aimed at promoting cross-team collaboration on mini-projects, to the permanent relocation of whole corporate departments within accelerators’ facilities or in startup companies. In Europe, for instance, the London-based LMarks offers internal innovation programs through which selected corporate members can spend some months as interns or employees within a startup in their portfolio to learn about its business and operational modes, as well as bespoke acceleration programs dedicated to corporate teams. Similarly, the Italian university-based incubator PoliHub, based in Milan, offers spaces in which entire corporate business departments can be relocated to work on their projects. As the corporate relations manager explained: *“initially we started working with small teams, like five people and the innovation manager, to create a team that is dislocated from the core business, far from those ‘corporate logics’ that you find*

within large companies [...] and now for instance, a big energy incumbent company has moved an entire digital development department here.” NUMA²⁹, a French-based accelerator, offers a package of learning and training services through which the same tools and methods they use with startups development are used to speed up corporates’ internal innovation projects. In Portugal, Beta-I has offered business innovation solutions to established firms such as Nestlè, Ikea, and L’Oreal to help them get closer to their customers and ideate new products. Similarly, in the Middle East Nest offers various internal innovation services aimed at helping both employees and leaders identify and prioritize innovation challenges, and equip them “*with the tools and structures that teach them to experiment and test new products/ideas with a human-centered and agile approach.*”³⁰ Finally, in the US accelerators such as TechStars or the GAN-affiliated Northeast Indiana Innovation center offer a wide range of corporate innovation services such as short boot camps or dedicated monthly programs to transfer them entrepreneurial capabilities through mentoring and coaching services. As one informant summarized, this is important for corporates:

“There is a mindset that corporates can benefit from. Understanding how startup are scrappy, how startups exploit opportunities, how startups manage and mitigate risk, how startups bootstrap ... I think that what we know about the techniques that startup companies use is directly supportive of the work we might do with larger companies. It’s not one-to-one translatable because obviously larger companies do not have the same resource constraints, they may not have the same market constraints as startup companies, but there is a pretty good correlations between the techniques of startups and how those can benefit larger companies.” (accelerator director)

In the case of new ideas development, accelerators usually perform preliminary sessions with the corporate management teams to select and identify the ideas they want to work on and map the competencies needed to execute them properly in order to create a project team. Depending on whether such competencies can be found internally or not, accelerators’ team members can work alongside managers to scout them among employees or search externally. H-Farm, for instance, has scouted some IT profiles for an Italian packaging company seeking to

²⁹ <https://www.numa.co/en>

³⁰ <https://www.nest.vc/corporate-services>

develop a digital application, and accelerated the team for four months in their facilities before relocating the project team inside the organization. The project team so created then goes through an intense mentorship and development program at the accelerator's facilities aimed at developing the project and testing it before going back to the parent organization, during which they can benefit from the accelerator's coaching and assistance on an ongoing basis. As a corporate informant who participated in a program run by LMarks explained:

“One of our main goals has always been creating new businesses for the next generations. In this context, this program contributes to providing a fair opportunity for all employees to acquire and expand their experience toward intrapreneurship. We wanted to boost the company culture and encourage employees to have a challenging mindset, provide learning and development opportunities to employees, and encourage them to think about new businesses. So we decided to run it with LMarks because of their experience in innovation programs, and with several international enterprises. We appointed L Marks as our local external accelerator to formalize the structure, alter the scoring criteria and to ensure the programme was successful for our broad region (EMEACIS). Their involvement has been critical at all stages, including promotion and education of the program across our regions, but the most critical part is their involvement in the programme live stage, where participants work with them and external mentors to refine each project.”

DISCUSSION

Engaging in corporate entrepreneurship activities can be difficult for established firms, but is crucially important to maintain their competitiveness and growth in the long run. While the corporate entrepreneurship literature has so far focused on solutions and activities that incumbent firms can pursue within their boundaries – such as developing and introducing new products, services, and operational processes or methods, investing in corporate ventures, or creating their acceleration programs – it has left unexplored solutions offered by innovation intermediary organizations such as venture associations, science parks and incubators, and accelerators. Our study shed light on this gap by focusing on an increasingly important – yet significantly understudied – category of innovation intermediaries, that is business accelerators. Through an interview-based study of accelerators worldwide, supplemented by complementary observations and archival data collection, we mapped the landscape of corporate services offered by accelerators and identified four ways through which corporates can engage with accelerators as intermediaries

to foster corporate entrepreneurship and innovation. These are: i) *vertical acceleration programs (verticals)*; ii) *scouting services*; iii) *pilot experimentation programs (pilots)*; iv) *intrapreneurship programs*. We have identified two criteria along which these four solutions can be distinguished: the degree to which they address a specified or unspecified innovation goal, and the degree to which they focus on individual firms or networks of collaborating organizations. While industry verticals and pilots are generally focused on fostering collective learning through connections among corporates with similar technology interests and between them and new ventures developing relevant technologies, scouting and intrapreneurship programs focus on bolstering internal innovation or searching for potential partners for individual organizations. While verticals and scouting services entail exploration of a broad range of innovation opportunities without articulation of corporate innovation needs a priori, pilots and intrapreneurship programs are germane for developing specific innovation projects or provide employees with specific tools and techniques defined before the start of the program. In Table 3, we present a comparison of the four engagement models. A more in-depth comparison between the four engagement modes is provided in Appendix 1.

-----INSERT TABLE 3 ABOUT HERE-----

Despite these engagements modes are driven by different rationales and entail different business models on the part of accelerators offering them (see Appendix 1), they are not mutually exclusive and can be combined to realize valuable synergies. Intrapreneurship programs, for instance, can be combined with pilots or scouting services to develop and co-create innovations through collaboration with startups. Similarly, a corporate may participate to a vertical program to explore the landscape of innovative ideas and technologies within a sector, while engaging in pilots to solve a specific internal challenge in another. Furthermore, firms approaching corporate entrepreneurship initiatives through accelerators may start out with lighter engagement modes such as bespoke scouting services or internal innovation assessments that enable them to scan the market and explore potentially relevant technologies and solutions, and use these programs as experiments (Hampel et al., 2019) to evaluate their value creation potential and start building a

supporting culture and organizational structure. These models can thus serve as a flexible toolkit of options that can be synergically combined and that, while being beneficial on their own, can be enacted sequentially or concurrently to create valuable synergies that surpass their individual benefits. In this section, we turn to a general discussion of the implications of our findings for theory and future research on corporate entrepreneurship and accelerators.

Fostering corporate entrepreneurship across organizational boundaries

Prior research has highlighted that despite the importance of engaging in corporate entrepreneurship initiatives for maintaining competitiveness and growth in the long run, large established firms are often discouraged by the high costs, risks, distant returns, complexity, and lack of internal and external legitimacy that these initiatives may entail (Burgelman, 1983; Katila et al., 2008; Raisch & Tushman, 2016). While extant research has mostly focused on corporate entrepreneurship initiatives that are initiated within organizational boundaries – including innovation, strategic renewal, corporate venturing, and corporate accelerators – our findings shed light on the important role of intermediary organizations such as business accelerators in enabling and assisting firms in these endeavors. Collectively, our findings suggest different reasons why business accelerators can be valuable allies for corporates to help them engage in corporate entrepreneurship activities.

First, due to their unique positioning as central actors within entrepreneurial ecosystems, accelerators (like other intermediaries such as venture capital investors, incubators, and science parks) are exposed to a continuous flow of information about relevant industry trends, new ideas, and promising emerging ventures, and have significant gatekeeping privileges over the startups community. They have, for instance, access to privileged networks and channels to reach startups globally, as well as knowledge and expertise in participating in dedicated events and scouting promising businesses. This unique network positioning can spare incumbents the significant investment of time and resources required to continuously scan the market for relevant business ideas, and enable the creation of nonlocal ties that are critical for exploration. Accelerators can

provide their own resources (such as dedicated personnel, time, and financial investments) to serve as outsourced exploration units, on which corporations can tap only when needed.

Second, accelerators have expertise advantages over corporates in searching, scouting, attracting and developing promising ideas, as well as designing acceleration or pilot programs that ensure the realization of mutual gains between corporates and new ventures. These skills are crucially important for firms that want to initiate corporate accelerators, since designing and executing these programs as well as managing relations with startups are challenging tasks (Cohen et al., 2018; Jackson & Richter, 2017; Richter et al., 2018) and therefore mastering these capabilities is important to secure mutually beneficial collaborations. But accelerator's specific expertise in developing valuable ideas and bringing them to the market is also valuable for corporates' willing to initiate and grow new businesses within their boundaries (Raisch & Tushman, 2016), as well as to foster managers' and employees' entrepreneurial capabilities by transferring them specific mindsets or methods.

Finally, accelerators have reputational advantages over corporates in the eye of startups, and thus can help corporates alleviate the lack of legitimacy and trust that entrepreneurs may feel towards them when evaluating opportunities for investments or collaboration (e.g. (Doz, 1987; Katila et al., 2008; Minshall et al., 2010). Often, established firms are seen as "sharks" (Katila et al., 2008) whose primary interest is stealing startups ideas and taking advantage of higher bargaining power over startups who need their support to survive. Conversely, due to their origins as organizational sponsors (Cohen et al., 2018), accelerators are legitimate players in startups ecosystems due to their strong identity as organizations whose mission is to help new ventures succeed. Since acceleration programs are valuable business development devices for young ventures and affiliation with prominent accelerators can enhance their own legitimacy towards customers, investors, and stakeholders, entrepreneurs are likely to look favorably at accelerators-backed initiatives.

The four engagement modes that our study identify complement available studies about “how corporate entrepreneurship is enacted in organizational settings” (Kuratko & Audretsch, 2013), and shed light on the inter-organizational arrangements that established firms may join to overcome the challenges of pursuing corporate entrepreneurship in the age of disruption (Kuratko et al., 2015; Kuratko & Hoskinson, 2018). Through vertical programs, corporates can explore a wide array of innovative products, services, or technology solutions, mentor and learn alongside startup companies, forge relations with industry fellows, and actively participate in the development of their industries by serving as sponsors for startup companies. Through pilot programs, established businesses can solve internal challenges and integrate innovative technologies by getting direct access to relevant startups, carry out experimental collaboration projects, and join multilateral collaboration settings with other established firms. Through scouting services, incumbent firms can foster organizational rejuvenation by connecting with startups tailored around their interests, and evaluate opportunities for technology integration and collaborative innovation with minimum resource commitment and without sharing their strategic roadmap with other companies. Finally, through intrapreneurship programs, incumbent firms can nurture internal innovation by developing employees ideas or acquiring skills and methods that can facilitate organizational renewal.

Accelerators as corporate entrepreneurship intermediaries

Our findings shed light on various solutions through which accelerators create value as intermediaries in incumbent firms’ corporate entrepreneurship endeavours. Available studies have looked at accelerators as organizational sponsors for new ventures (Cohen, Fehder, Hochberg, & Murray, 2019; Cohen & Hochberg, 2014; Cohen et al., 2018), as creators of entrepreneurial ecosystems (Ketan Goswami et al., 2018), or as programs that corporations can set up and run within their boundaries (Jackson & Richter, 2017; Kohler, 2016; Shankar & Shepherd, 2018; Weiblen & Chesbrough, 2015). There is, however, a substantial lack of research about how accelerators, due to their unique positioning within entrepreneurial ecosystems and their expertise

as innovation catalysts, may create value for incumbent firms and help them explore opportunities, access promising startups, and develop new projects while remaining independent organizations and acting from outside the boundaries of the firm.

Our findings reveal important but untheorized ways through which accelerators serve the needs of corporations and support their entrepreneurial endeavours. Our insights are consistent with recent conceptualizations of accelerators as organizations aimed at “stimulating entrepreneurship” and that “take an active and salient role in socio-economic and technological advancement” (Wright & Drori, 2018: 2). But our analysis offers further understanding into how these emerging yet increasingly important innovation intermediaries can serve as valuable partners for incumbents to foster exploration and entrepreneurial behaviors. As corporate entrepreneurship intermediaries, accelerators can help incumbents take an active stance in shaping the evolution of their industries by sponsoring the development of the very ideas and technologies that are likely to disrupt them, co-create new products, services, or organizational processes through collaborations with innovative ventures, and identify opportunities for creating new businesses or fostering organizational members’ entrepreneurial orientation.

Furthermore, while available studies have focused on the ways through which incumbent firms can engage with startups and “transform them into engines of corporate innovation” (Weiblen & Chesbrough, 2015: 78) through the lenses of Corporate Venture Capital (CVC) investments (see, e.g., Dushnitsky & Lenox, 2005; Wadhwa & Kotha, 2006) and more recently corporate accelerators (Kohler, 2016; Richter et al., 2018; Shankar & Shepherd, 2018), the typology that we develop starts to delineate a wide array of alternative ways through which accelerators enable incumbent firms to connect with startups and initiate collaborations with them. By focusing on accelerators as independent corporate entrepreneurship intermediaries rather than as corporate-led program, we thus complement available studies on the different ways through which incumbent firms can engage with young ventures to enhance corporate innovation (e.g., Weiblen & Chesbrough, 2015) and shed light on various emerging forms of corporate-startup relations that

do not entail either direct investments in startups' equity nor the setup of corporate-funded acceleration or incubation programs. The engagement modes that our typology identifies direct attention towards some alternative paths through which incumbent firms and startups can match and work together, in which accelerators have a central role in balancing the different interests of corporations and new ventures entering collaborative relations (e.g., Katila et al., 2006; Doz, 1987). A thorough understanding of these emerging yet important engagement modes is needed if we are to have a complete picture of the value of accelerators in the framework of corporate entrepreneurship.

Implications for practice

Practitioners could use our typology as a map to assess the different ways accelerators can help them bring innovation in their companies. Awareness of the different options available as well as the rationale behind them is critical for fit between these corporate entrepreneurship initiatives and the strategy of the firm. Furthermore, as we have argued in the above, these different paths are not mutually exclusive, and multiple programs can be run in parallel to fit the multitude of strategic interests incumbent organizations may have. Besides corporate managers, business accelerators managers may find in our typology a valuable tool to structure their offering and selling it to corporate clients. Our study offers them an empirically backed map of corporate services they may offer, as well as on the business models behind each of them. Since the choice of the appropriate program is critical for its subsequent success, having a simple tool that can orient this choice may be valuable for corporates and accelerators managers alike to better engage with each other.

CONCLUSIONS

Emerging organizational forms such as accelerators have growing importance as intermediaries for incumbent firms' innovation activities. Traditional accelerators (e.g., Cohen et al., 2018, 2019) are increasingly offering services for established firms, transitioning from serving as organizational sponsors for startups to open innovation hubs for corporates, and creating

valuable connections between incumbent firms and young ventures. In this study, we have mapped different solutions through which accelerators help corporations explore opportunities, enact entrepreneurial behaviors internally, forge relations with young ventures, and overcome the challenges of pursuing corporate entrepreneurship. Our findings offer further understanding of how corporate entrepreneurship happens across the boundaries of the firm, and extend current understanding of the role of accelerators in the framework of corporate entrepreneurship by conceptualizing them as independent organizations with distinctive knowledge and expertise on which incumbent firms can tap.

While our interview-based study design allowed us to uncover various ways through which accelerators and corporates can collaborate, future work is needed to test and expand our arguments. First, although our insights suggest some criteria that may orient incumbent firms' choice towards the different programs offered by accelerators, our data did not allow us to predict when it is more likely that firms would choose one option versus another. Second, while our respondents highlighted the benefits that these programs entail for incumbent firms – and in some cases entrepreneurial ventures – these benefits are likely to be different across firms, and the impact of these programs on firms' entrepreneurial activities is likely to depend on some organizational or environmental contingencies that we were not able to explore in this study. As our informants emphasized, fostering engagement from organizational members at different levels is a crucial determinant of these initiatives' success. How such engagement varies across programs and how it may be fostered or hampered by CEO's leadership styles (e.g., Chen & Nadkarni, 2017) as well as organizational members disposition towards open innovation (e.g., Lifshitz-Assaf, 2018) are open questions for future investigations. Similarly, one may ask to what extent participating to initiatives that entail experimental innovative projects between corporates and startups – such as pilots – may lead new ventures to identify new business opportunities or pivoting their business, and what implications this may have for them. We encourage researchers interested in the role of accelerators

and inter-organizational relations in the framework of corporate entrepreneurship to explore these dynamics, extend, and challenge our work.

TABLES AND FIGURES

TABLE 1
Interviews summary

Type of organization	Organization ID	HQ location	N. of interviews	N. of interviewees	Role(s) in the organization
Strategy consulting & startups accelerator	IT1	Venice, Italy	3	3	Strategy & innovation Culture project manager / Open Innovation Project Manager (2)
Accelerator & Venture Capital Investor	IT2	Milan, Italy	1	1	Head of operations
Strategy consulting & startups accelerator	FR1	Paris, France	1	1	Innovation programs designer
Accelerator	FR2	Paris, France	2	1	Director of corporate development
Accelerator	NY1	New York, NY, USA	1	1	Global partnership & sponsorships specialist
Innovation center & startups accelerator	AN1	Antwerp, Belgium	1	1	Senior Business Development
Accelerator	PR1	Prague, Chzech Republic	1	1	Head of Partnerships
Innovation center & startups accelerator	FW1	Fort Wayne, Indiana, USA	1	1	President and CEO

Innovation center & startups accelerator	IT3	Milan, Italy	1	2	Investor Relations manager / Head of district development and corporate projects
Strategy consulting & startups accelerator	UK1	London, UK	4	3	Head of Development / Account Manager Intrapreneurship program / Program Manager innovation Lab
Strategy consulting & Venture Capital Investor	UK2	London, UK	2	2	Director / Head of Development
Strategy consulting & startups accelerator	FR1	Paris, France	1	1	Managing partner
Accelerator	LI1	Lisbon, Portugal	1	1	Open Innovation specialist
Accelerator	RU1	Moscow, Russia	1	1	Head of International Development
Strategy consulting & startups accelerator	UK3	London, UK	1	1	Director
Accelerator	UK4	London, UK	1	1	Head of programs
Accelerator	IT4	Firenze, Italy	1	1	Open Innovation project owner

Corporate	FashCO	Milan, Italy	3	6	Head of strategy / Strategy projects manager / Strategy projects specialist Merchandising Manager, Social Media, Digital Initiatives
Corporate	PaperCO	Moscow, Russia	1	1	Director for Product and Technology Innovations
Corporate	Corp	Japan	1	1	Innovation Program Manager
Corporate	DriveCO	Moscow, Russia	1	1	Incubator Program Office Europe
TOTAL			30	32	

TABLE 2
Summary of data and their use in the analysis

Data source	Type of data	Use in the analysis
Formal interviews	Semi-structured interviews (30 interviews with 32 informants, of which 3 email interviews and 27 semi-structured formal interviews)	Get a thorough understanding of services offered to corporations with regards to their scope, functioning, corporate goals, corporate involvement, as well as collecting short stories and examples of specific projects
Non-participant observations	Field notes from attendance to three industry symposium on corporate accelerators /innovation ecosystems / corporate entrepreneurship (37 pages)	Engage with the study context through listening to speeches from corporate managers and accelerator managers; triangulate and enrich interviews data; engage in impromptu conversation with participants
Archival data	Blog articles; company presentations; Industry reports; Press news; Websites information; Accelerators' periodic newsletters	Familiarize with the study context; support, integrate, and triangulate evidence from interviews and notes; analyze the description of the corporate services advertised on the websites as well as on commercial materials.

TABLE 3
Main features of the four different collaboration models between corporates and accelerators

	Verticals <i>(unspecified goal, network-centred innovation)</i>	Pilots <i>(specified goal, network-centred innovation)</i>	Scouting <i>(unspecified goal, company-centred innovation)</i>	Intrapreneurship programs <i>(specified goal, company-centred innovation)</i>
<i>Emergence and definition of innovation/ collaboration opportunities</i>	During or after the program	Before the program	After the scouting	Before the program
<i>Fixed-duration, structured program</i>	Yes	Yes	No	Yes
<i>Participants selection criteria</i>	Fit with the theme of the vertical (i.e. specific industry or technology)	Fit with specific corporate problems/challenges	Potential fit with the corporate client's business	(when applicable) relevance for the corporate client's business
<i>Expected CE outcomes</i>	Corporate acceleration; opportunities for external corporate venturing; opportunities for innovation	Opportunities for innovation	Opportunities for innovation and external corporate venturing	Opportunities for innovation, strategic renewal, and internal corporate venturing

FIGURE 1
Geographic location of the accelerators in the sample

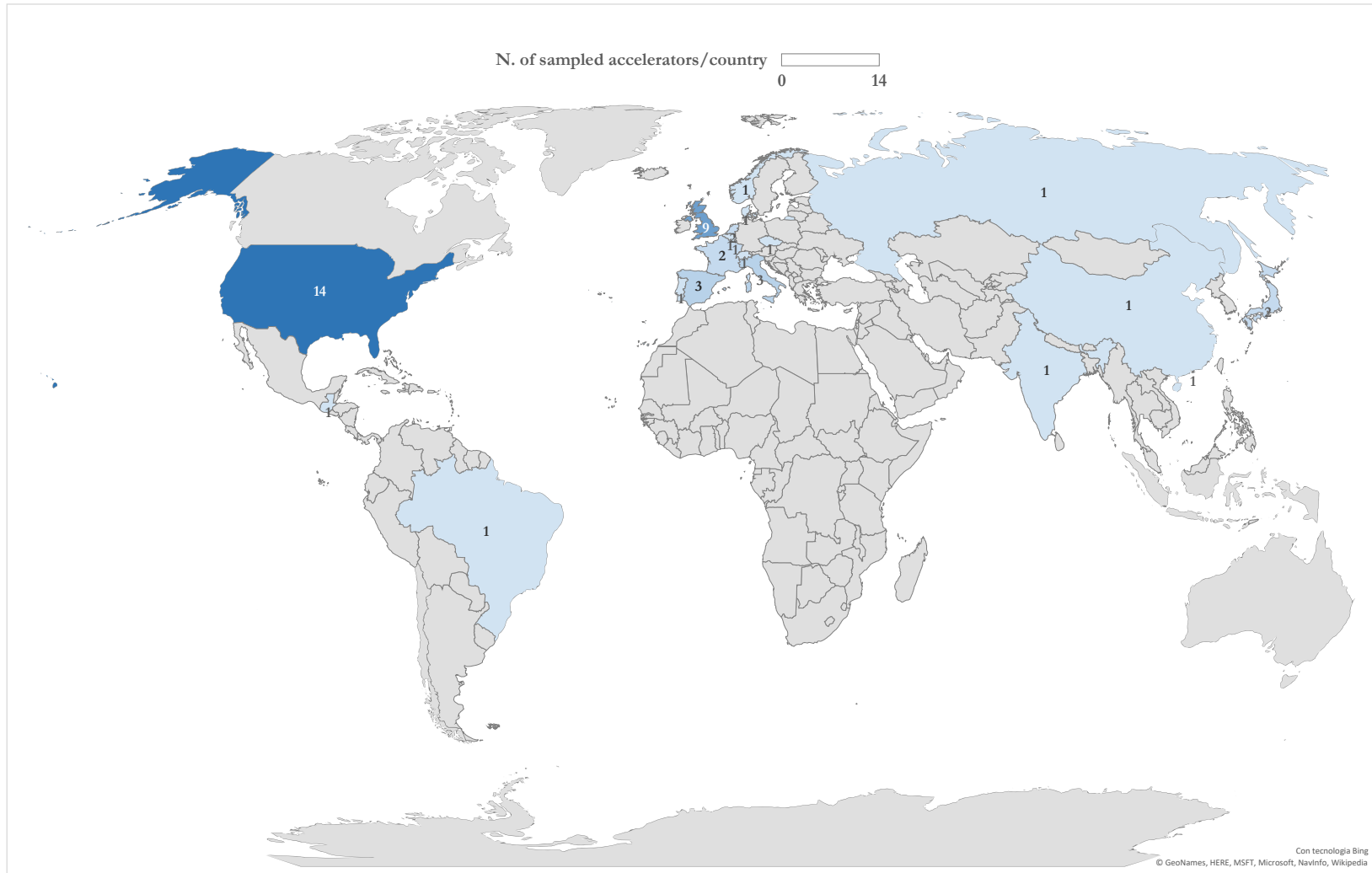


FIGURE 2

A typology of four ways through which accelerators help incumbent firms engage in corporate entrepreneurship activities

		Unspecified	Innovation goals	Specified
Locus of innovation	Network-centred	Verticals		Pilots
	Corporate-centred	Scouting		Intrapreneurship

FIGURE 3
Timeline of a typical vertical program

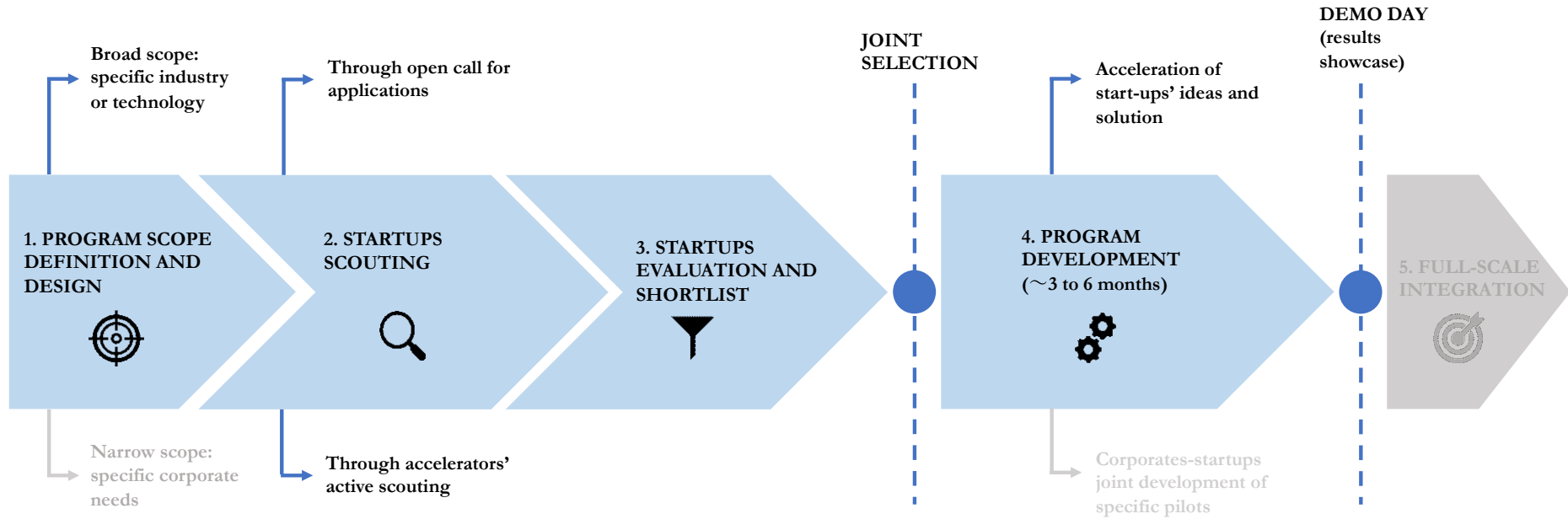


FIGURE 4
Timeline of a typical pilot program

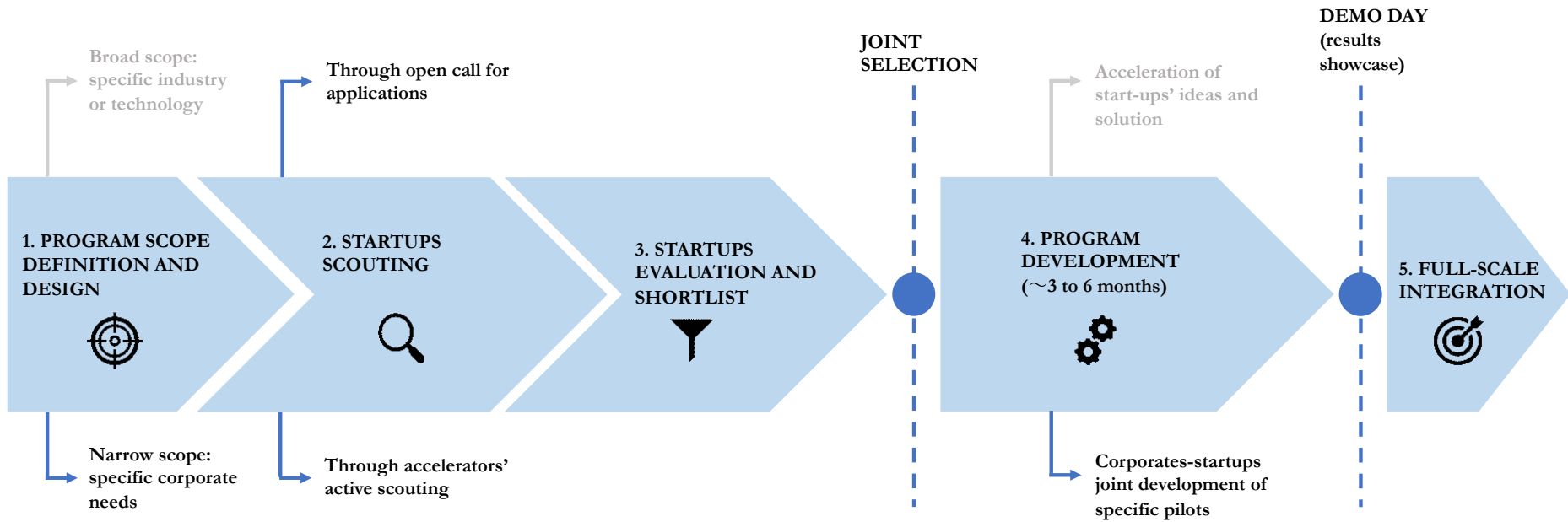


FIGURE 5
Timeline of a typical scouting

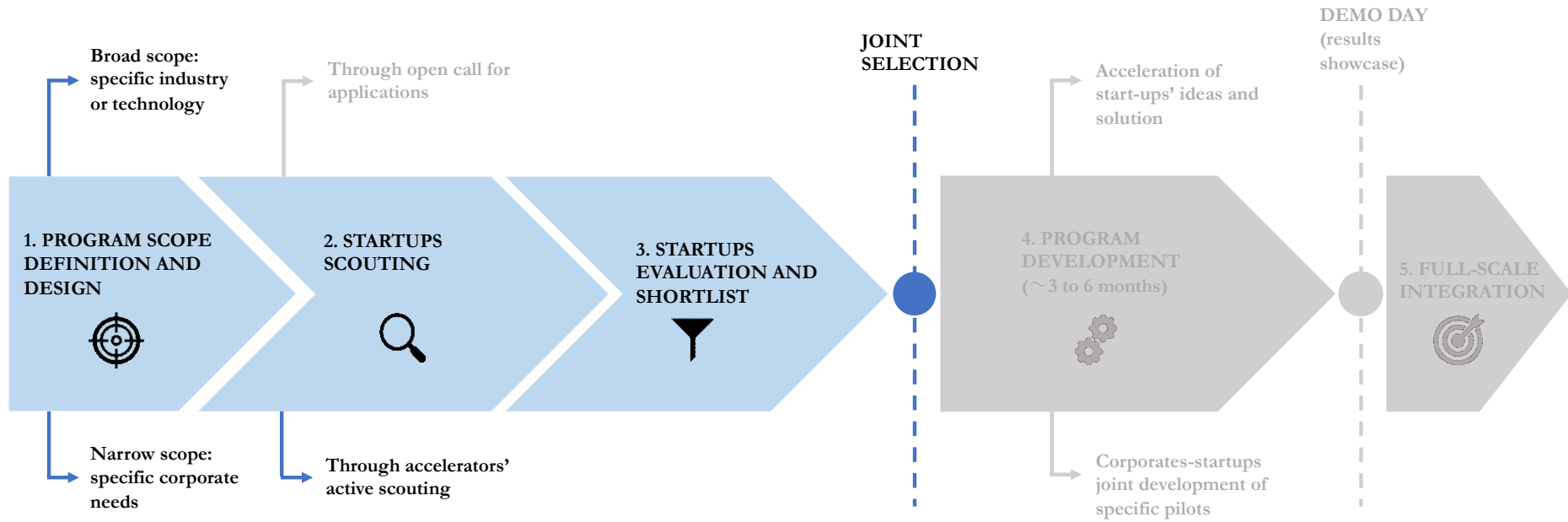
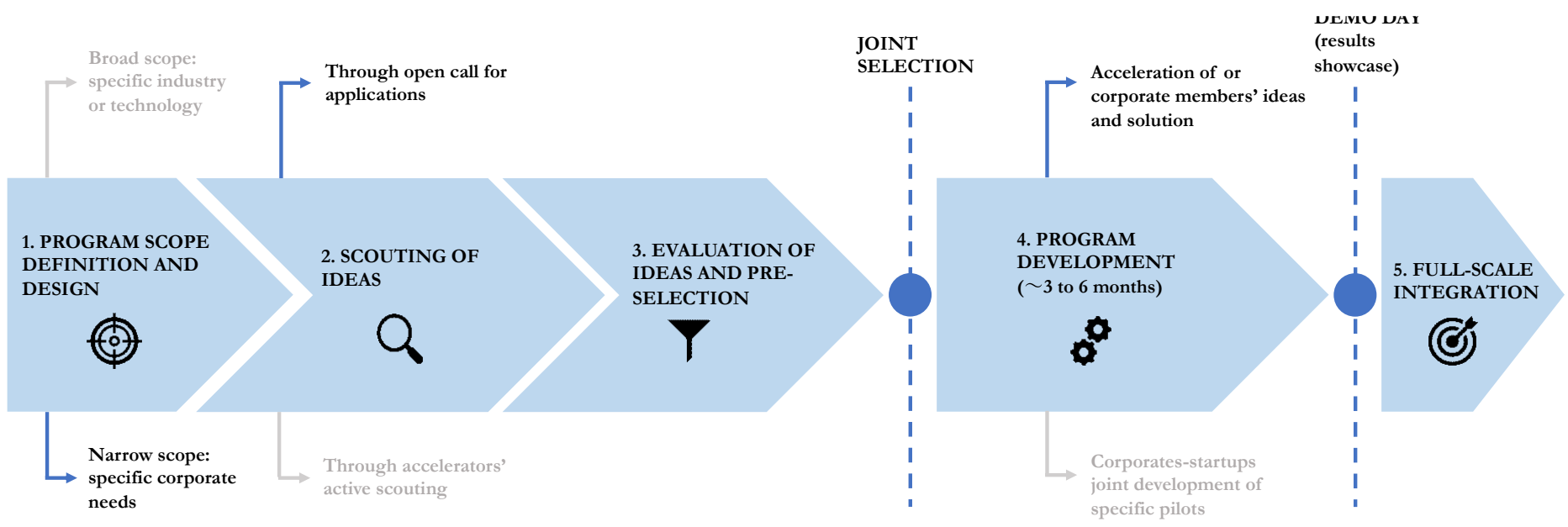


FIGURE 6
Timeline of a typical intrapreneurship program



SUPPLEMENTARY MATERIALS

APPENDIX 1

In-depth comparison of the four different collaboration models between corporates and accelerators

	<i>Verticals</i> (unspecified goal, network-centred innovation)	<i>Pilots</i> (specified goal, network-centred innovation)	<i>Scouting</i> (unspecified goal, company-centred innovation)	<i>Intrapreneurship programs</i> (specified goal, company-centred innovation)
<i>Description</i>	A third-party accelerator designs and sets up traditional acceleration program aimed at supporting the development of startups in a specific industry or technology vertical. Single or multiple corporates financially sponsor the program's design and serve as mentors for the participating startups. The acceleration program is specifically design to allow one or more corporate partners to explore innovative ideas and technologies in a given industry.	A third-party accelerator designs and sets up a bespoke program through which multiple corporate partners in a given industry work on specific pre-defined challenges with startups developing relevant technologies or solutions. The program is tailored to the needs of the industry partner and entirely focused on the quick development of experimental projects (i.e., pilots).	A corporate commissions a third-party accelerator to search for innovative startup companies operating in a target market segment/technology within a pre-determined geographical scope. The aim is to present the corporate client with a shortlist of potential startups partners with whom the corporate may be interested in evaluating collaboration opportunities. There is no structured program after the final selection of the best matches.	A third-party accelerator delivers specific services aimed at fostering internal innovation within a corporate client. These can vary from the acceleration of specific ideas from corporate employees, to innovation assessments, to the relocation of corporate teams within the accelerator's facilities or the offices of some startups partners. Accelerators provide training, participate in scouting and recruitment of people to develop specific projects, or create and develop startups on demand.
<i>Underlying accelerator's business model</i>	Exploration as a service	Collaboration as a service	Scouting as a service	Startup as a service

<i>Corporate goals</i>	<ul style="list-style-type: none"> • Exploring the technology forefront of a target industry without setting up an internal accelerator • Gaining insight about early innovation and business model that startups are developing within the firm's target industry • Investing in high-potential startup companies • Forging relations with other corporates within the same industry and get industry insights 	<ul style="list-style-type: none"> • Finding startups to collaborate with to solve specific business problems • Fast technology integrations and experimentation • Forging relations with other corporates within the same industry and get industry insights • Learning from industry fellows • Experimenting with startups in a controlled environment with support from experienced accelerators • External talent acquisition 	<ul style="list-style-type: none"> • Exploring the technology forefront of a corporate's industry, • Obtaining a list of pre-selected, potentially interesting startups tailored around strategic interests • Evaluating potential collaboration opportunities 	<ul style="list-style-type: none"> • Fostering entrepreneurship and innovation within the company • Developing employees' ideas and innovative projects • Learning new working methods • Internal talent development • Cultural transformation • Creation and development of corporate spin-offs
<i>Corporate commitment</i>	<ul style="list-style-type: none"> • Corporates financially sponsor the program • Periodic meetings with startups • Corporate employees involved as startups mentors • Participation to program events such as kick-off and final demo day • Corporate internal sponsorship to involve as many corporate people as possible to actively work with startups 	<ul style="list-style-type: none"> • Corporates are partners in the development of the program and financially sponsor it • Participation in initial assessment of business challenges • Participation in startups selection • Regular activities and meetings with the startups during program development • Participation to program events such as kick-off and final demo day • Corporate need to provide resources to the startups during pilot development 	<ul style="list-style-type: none"> • Participation in initial assessment of business challenges • Participation in development of the scouting brief • Participation in final selection of startups • Corporates usually host a startups pitch day at the end of the scouting 	<ul style="list-style-type: none"> • Corporate managers and employees are actively involved in the development of their ideas or in specific training or educational activities • Corporate provides access to internal resources and data to the accelerator team during the initial innovation assessment • In case of creation of a startup, corporate actively involved in search for needed competencies internally or externally

		(internal data and mentoring, business network)		
		<ul style="list-style-type: none"> • Involvement of sponsor within the management team and of corporate employees to interact with the startups 		
<i>Potential innovation outcomes for corporates</i>	<ul style="list-style-type: none"> • Visibility on broad range of potentially interesting technologies • Access to high-quality startups pre-selected by trustworthy accelerator (with expertise in selecting startups and developing their ideas) • Priority access to funding promising startups • Potential business synergies if startups in target industry match corporates' technology interests • If multiple sponsors, potential learning benefits from industry fellows 	<ul style="list-style-type: none"> • Visibility on broad range of potentially interesting technologies • Access to startups targeted to specific business needs • Access to high-quality startups pre-selected by trustworthy accelerator • Realization of business synergies and quick technology integrations • If multiple sponsors, significant learning benefits from industry fellows • Access to talent (designers, coders, etc.) 	<ul style="list-style-type: none"> • Visibility on broad range of potentially interesting technologies • Creation of database of potential startup partners in one or multiple areas of interest • Final pitch day as inspirational event for corporate employees 	<ul style="list-style-type: none"> • Defining and developing internal ideas through a proven (third-party) acceleration method • Nurturing alternative ways of working and cross-functional collaborations within the company • Quick development and market test of innovation projects • Potential for corporate-owned spin-off if testing is successful • Potential for parallel business model if spin-off is successful

<p><i>Main advantages for corporates</i></p>	<ul style="list-style-type: none"> • Visibility on many potentially interesting technology • If multiple partners, learning benefits • Possibility to share investment with other partners, • Appropriate choice if ideas are still unclear or as first step to explore innovative technologies) 	<ul style="list-style-type: none"> • Program specifically designed around partners' needs and bespoke to needs of the collaborating organizations • Learning from industry fellows and startups • High likelihood of good matching with relevant startups and quick development of experimental collaborations • Possibility to share investment with other partners • Appropriate choice if ideas are clear and the corporate is willing to provide resources to startups and actively participate in pilot development 	<ul style="list-style-type: none"> • Higher confidentiality and exclusivity • Lower resource investments and low level of commitment from corporate employees • Appropriate choice if the corporate want to see results of the search within short time, and is willing to spend time in the definition of the brief and the selection of the startups 	<ul style="list-style-type: none"> • Highest degree of customization. Program specifically tailored around a company's needs and/or employees ideas • Development of internal talents • Accelerator provides own methods and guidance in development of idea or recruitment of dedicated personnel • Potential for bolstering innovation in 'slow' or 'behind' divisions or business units
<p><i>Potential risks for corporates</i></p>	<ul style="list-style-type: none"> • Untargeted program, may end up with nothing (no a priori specification of needs) • Need actual involvement of corporate employees to get tangible benefits • Tangible results usually visible in long run • Corporate venturing uncertain and may not yield desired returns 	<ul style="list-style-type: none"> • Requires partners some degree of sharing their technology interests/business needs with industry fellows • Access to startups is shared with other companies, no exclusive partnerships • Technology/solution integration may be more difficult than expected or fail • Results of experimental collaborations highly uncertain 	<ul style="list-style-type: none"> • Success depends upon the quality of the brief, if too broad or too narrow there is risk of not finding relevant solutions; • Pilots are not certain, risk of not finding developed/interesting enough startups to test • Execution of collaboration/pilots is up to the company, low to no assistance from the accelerator 	<ul style="list-style-type: none"> • May entail higher investment compared to other engagement forms due to great customization • Results in terms of innovation outcomes may be very hard to measure • Longer time horizon • Company's employees need to be willing to spend time on the idea or being exclusively dedicated to it • Ideas may not be successful and never become a corporate spin-off

<i>Potential advantages relative to:</i>				
b) Internal R&D	<ul style="list-style-type: none"> • Broader exploration scope (external ideas) • Outsourced scanning of the environment for innovation trends • Does not require company's member to be or become expert in a given technology/product 	<ul style="list-style-type: none"> • Broader exploration (external ideas) • Outsourced scanning of the environment for innovation trends • Does not require company's member to be or become expert in a given technology/product 	<ul style="list-style-type: none"> • Broader exploration (external ideas) • Outsourced scanning of the environment for innovation trends • Does not require company's member to be or become expert in a given technology/product 	<ul style="list-style-type: none"> • Accelerator provides a proven (third-party) method to develop internal idea, potentially faster and cheaper than internal development
c) Corporate venturing investments	<ul style="list-style-type: none"> • Less risky, corporate can invest only if interested • Can explore several technologies without committing to invest in just a few 	<ul style="list-style-type: none"> • Less risky, startups do not have to be successful in the long run to see results • Can explore several technologies without committing to invest in just a few • Assistance from accelerator in execution helps the company to learn how to integrate technologies (learning mechanisms conditional to CVC investments success) 	<ul style="list-style-type: none"> • Can explore several technologies without committing to invest in just a few • Less risky, startups do not have to be successful in the long run to see results • 	<p>Potential for development of corporate spin-offs rather than investment in independent startups (potentially, more control over idea development from inception and on business operations)</p>
a) Internal (corporate-owned) acceleration programs	<ul style="list-style-type: none"> • Lower commitment (of human and financial resources) • Corporate does not have to provide services and education to startups • Personnel specifically dedicated to managing 	<ul style="list-style-type: none"> • Lower commitment (of human and financial resources) • Program not aimed at developing startups ideas but designed to fit internal challenges 	<ul style="list-style-type: none"> • Lower commitment (of human and financial resources) • Corporate does not have to provide services and education to startups • Personnel specifically dedicated to managing 	<ul style="list-style-type: none"> • Program focused on intrapreneurship rather than development of external startups

startups relations is not required

- Shorter time horizon, do not have to commit to accelerate several cohorts before seeing results

- Corporate does not have to provide services and education to startups
- Personnel specifically dedicated to managing startups relations is not required
- Shorter time horizon, do not have to commit to accelerate several cohorts before seeing results
- Experienced accelerator does matching and provides assistance during pilot development

startups relations is not required

Startups selection is outsourced to experienced accelerator

THE ROLE OF BOUNDARY ORGANIZATIONS IN CORPORATE- STARTUP COLLABORATIONS ACROSS DOMAINS: A CASE IN FASHION-TECH

ABSTRACT

In this paper, we investigate the role of boundary organizations in the formation and management of exploratory inter-organizational collaborations between incumbent firms and new ventures across expertise domains. To do so, we conducted a longitudinal field study of an open innovation program involving a digital hub firm, an established global company in the fashion industry, and a group of high-tech startups. Our findings illustrate the evolving ambiguities that incumbent firms and young ventures face as they seek to envision opportunities for collaborative innovation, combine their resources in value-creating ways, and experiment with collaborative projects that can create mutual gains. We theorize that boundary organization can enact different types of boundary work as they assist the collaborating firms to address these challenges, depending on the type of ambiguity they are called to solve at different stages of the collaboration process: cross-domain framing work, misaligned translation work, and collective orchestration work. Based on our analysis, we develop a process model that shows how boundary organizations enable and assist exploratory inter-organizational collaborations across domain over time by morphing their role and enacting different types of boundary work. Our arguments promote a dynamic, processual view of the evolving role of boundary organizations in inter-organizational collaborations, and have implications for theory and future research on boundary organizations, boundary work in inter-organizational relations, and collaborations between incumbent firms and startups.

Keywords: boundary organizations; corporate-startup collaborations; inter-organizational collaboration processes

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“Five years ago collaborating with startups was considered innovative. Now it's business as usual. But that doesn't mean it's working.”
(homepage of a corporate innovation consultancy company³¹, 2019)

INTRODUCTION

Around the world, innovations are increasingly created through collaborations between large established firms and new technology ventures. When they are successful, collaborations between established firms and large ventures can yield significant benefits for the participating organizations (Katila et al., 2008; Pisano, 1990; Rothaermel & Boeker, 2008; Wadhwa & Kotha, 2006; Weiblen & Chesbrough, 2015). A recent study by 500 Startups (a US-based global venture capital seed fund and venture accelerator) on over 100 Fortune 1000 companies in the U.S., Europe, and Asia (Younis, Desai & Sigal, 2017), for instance, shows that over 90% of them regularly engages with startups to access new technologies, talents, customers and markets, and harness their innovative potential to transform the way they do business. Similarly, other studies show that more than 50% of the Forbes Global 500 companies are “working with startups in one way or another” (Bonzom & Netessine, 2016: 25) and this rate goes up to 68% considering the first 100 companies in the list, and that corporates largely agree that that “they must collaborate with startups to innovate.” (Horn & Keyzer, 2014: 12)

Yet, the same studies also show that “while corporations are highly active in working with startups, the vast majority see less than 25% of their initial pilots with startups scale into solutions that can be taken to market” (Younis, Desai & Sigal, 2017: 6), and less of 10% of them eventually become commercial deals. Many factors can prevent corporates and startups to successfully work together, including asymmetries in power, culture, age, size, technologies, aspirations, trust, and language (Alvarez & Barney, 2001; Doz, 1987; Katila et al., 2008; Minshall et al., 2010). Often, the reasons why initial collaborations attempts do not scale can be traced back to corporates’ inability

³¹ <https://www.co-cubed.com>

to find the right startup partners at the right time and to address a relevant pain point and to effectively build the necessary commitment across different layers of their business, as well as the difficulties that corporates and startups face to converge to a mutual understanding of the collaboration goals, and the very different mindset that corporate leaders and entrepreneurs often have concerning their disposition towards speed, risk, and experimentation (e.g., Jackson & Richter, 2017).

As such, these collaborations are a common and yet still largely unexplored example of inter-organizational relations whose success largely depends on effective *boundary work* – that is, “practices through which groups, occupations, and organizations work at boundaries to develop and sustain patterns of collaboration and coordination in settings where groups cannot achieve collective goals alone” and which refers to the collaborating actors’ purposeful efforts to negotiate, align, accommodate, and downplay boundaries “to get work done.” (Langley et al.: 714) Often, such boundary work is not performed by the collaborating parties themselves, but by external mediators or intermediary organizations (Berkes, 2009; Bessant & Rush, 1995; Giudici et al., 2018; Howells, 2006; Sapsed et al., 2007) – such as innovation consulting companies, digital incubators, matchmaking firms, and venture accelerators – whose role is critical to help them identify opportunities for collaborative innovation and overcome their operational and cultural difference to work together and realize mutual gains. Despite the boundary work that these organizations play in enabling and assisting largely diverse organizations such as corporates and startups to collaborate across organizational as well as disciplinary boundaries is critical – especially at a time when such collaborations are so largely diffused and companies are investing increasing resources to ensure their successful realization – it has seldom been systematically explored in the literature.

In this study, we explore this critical issue by drawing on the concept of *boundary organizations* (Guston, 2001; Langley et al., 2019; O’Mahony & Bechky, 2008; Perkmann & Schildt, 2015). Such conceptualization is particularly fruitful as a starting point to explore how these intermediaries enable and assist corporate-startup collaborations – and inter-organizational

relations more in general – because it focuses on the efforts through which they combine different types and practices of boundary work to influence the interactions between the collaborating actors by standing in-between them (O’Mahony & Bechky, 2008; Parker & Crona, 2012) and acting from outside to enable “effective collective action of others and at a distance.” (Langley et al., 2019) Because they “exist on the frontier of two relatively distinct social worlds” (Guston, 1999), speak the language of multiple entities (Guston, 1999; Miller, 2001), and enable the realization of multiple (Perkmann & Schildt, 2015) and mutual (O’Mahony & Bechky, 2008) gains, boundary organizations are purposefully called upon when needed to manage inter-organizational interactions in a way that enables the collaborating parties to realize a collaborative goal while allowing them to remain independent entities and disband their relation as soon as the collaborative task is accomplished. Such conceptualization, therefore, portrays well the type of intermediary organizations that we study. Yet, although scholars have sometimes mentioned that boundary organizations broker “any aspect of the innovation process” (Howells, 2006: 720) by being part of “triadic role structures” (O’Mahony & Betchky, 2008) between the collaborating firms, the boundary work that such organizations play to make these collaborations work remains nonetheless largely undertheorized. We ask: *how do boundary organizations enable and assist the formation and management of exploratory inter-organizational collaborations across domains?*

We conducted a longitudinal study of an open innovation initiative in Fashion-Tech called “Exploration Program.” The program lasted approximately 12 months, was designed and run by an open innovation intermediary (which we call HubCo), and involved a leading multinational company in the luxury retail segment (FashCo) and various digital startups developing innovative solutions rooted in emerging technologies such as artificial intelligence, machine learning, and augmented reality. When FashCo first approached HubCo and asked for its support to scout, select, and manage experimental collaboration projects with innovative technology startups, they had no idea as for what they were looking for, how long the collaborations would have lasted, and which technology integration opportunities they could explore with them. Over time, HubCo enabled

them to get into contact with many potential partners, figure out what they could bring to one another, and enact experimental collaboration projects that brought together corporate employees and entrepreneurs working across different functions.

Based on our reconstruction of the process of collaboration among these very different actors as it occurred in real-time, our findings reveal that incumbents firms and startups willing to collaborate to co-create innovation face evolving challenges as they engage in strategizing, matching, and executing collaborative experimental projects. We define such evolving ambiguities as *strategic ambiguity* (i.e., where do we go?), *matching ambiguity* (i.e., with whom?), *task ambiguity* (i.e., with whom?), and *process ambiguity* (i.e., how do we get there?). To solve these ambiguities and successfully enable incumbents and entrepreneurial ventures to find one another and develop experimental collaborative projects, boundary organizations engage in different types of boundary work: *cross-domain framing work*, *misaligned translation work*, and *collective orchestration work*. We find that the role of boundary organizations does not remain stable over time, but dynamically changes and adapt as the participating firms seek to initiate and enact collaboration. Starting from these insights, we develop a process model that shows the evolving challenges faced by the collaborating firms as they move forward in different stages of collaboration, and highlights the morphing types of ‘work’ that boundary organizations enact to address such challenges and ensure a smooth collaboration process.

Our arguments have implications for theory and future research on boundary organizations, boundary work in exploratory inter-organizational relations, and collaborations between incumbent firms and entrepreneurial ventures. First, our findings encourage a rethinking of boundary organizations as dynamic, multifaceted entities whose role in supporting collaborations between organizations across domains is shaped over time, and as the needs of the collaborating parties evolve throughout the collaboration process. We show that such evolving and multifaceted boundary work is critical to enable and assist firms collaborate in inter-organizational arrangements aimed at the pursuit of innovation and where objectives are not well-articulated

upfront (Deken et al., 2018). We show how different types of boundary work can be enacted and combined in response to the evolving challenges that incumbents and new ventures face as they seek to combine their respective resources to generate innovation. Finally, differently from the available research on collaborations between established firms and new ventures, which is largely descriptive and focused on the asymmetry and trust issues in dyadic relations, our arguments illuminate how such issues can be overcome by collaborating through a boundary organization.

BACKGROUND

Exploratory Inter-Organizational Relations Between Incumbent Firms and Startups

Collaborations between incumbent firms and startups are exploratory processes whereby incumbent firms search for innovation opportunities in their external environments (Wadhwa & Kotha, 2006) by forming relations with young ventures as “new sources of technical expertise.” (Pisano, 1990: 155) These relations can take various forms (see, e.g., Weiblen & Chesbrough, 2015), be more or less enduring, and involve or not equity investments in startups on the part of the corporate partner – such as, for instance, CVC investments (Dushnitsky & Lenox, 2005a; Katila et al., 2008; Wadhwa & Kotha, 2006) or some forms of corporate acceleration (Kohler, 2016; Shankar & Shepherd, 2018). In this paper, we focus on the emerging breed of corporate-startup relations that do not entail either direct investments in startups’ equity (Katila et al., 2008) nor the setup of corporate-funded acceleration or incubation programs (Shankar & Shepherd, 2019). Instead, our attention is directed towards the less investigated – yet ever more popular – domain of collaborations that are primarily aimed at integrating technology solutions developed by startups into corporates’ products and organizational processes within short timeframes. These collaborations are temporary, exploratory inter-organizational relations between independent organizations (Parmigiani & Rivera-Santos, 2011), aimed at the creation of innovation through integrating work from actors across different domains of expertise, such as corporate managers and entrepreneurs (Doz, 1987).

The potential benefits of these collaborations for both corporates and startups have been well-documented by the literature. By forging inter-organizational relations with entrepreneurial ventures, incumbent firms can identify innovation opportunities by tapping “into the innovative and entrepreneurial potential of smaller companies” (Doz, 1987: 31), expand their “R&D boundaries” in face of technological change (Pisano, 1990: 174; Rothaermel & Boeker, 2008) acquire new knowledge (Wadhwa & Kotha, 2006), and ultimately transform startups “into engines of corporate innovation” (Weiblen & Chesbrough, 2015: 78). Young ventures, in turn, can access established firms’ organizational and financial resources (Alvarez & Barney, 2001; Katila et al., 2008) to commercialize their products and services, enhance their legitimacy and status through corporate endorsement (Stuart, Hoang, & Hybels, 1999), and ultimately gain support for their innovations from the very incumbent firms whose industries they aim to disrupt (Ansari et al., 2016).

As exploratory relations (Koza & Lewin, 1998), however, corporate-startup collaborations also pose distinctive challenges that can hinder their success and lead them to a fiasco. Because they are oftentimes motivated by incumbents’ needs to explore innovation opportunities in their external environment on the basis of ill-defined and unstable “technology interests” (Katila et al., 2008) that can span multiple sectors and change over time, prospective partners are likely to face ambiguity in partner selection (Deken et al., 2018; Simonin, 1999). Even after their formation, these partnerships are challenging to manage due to asymmetry issues (T. Das & He, 2006; Minshall et al., 2010) stemming from significant differences in bargaining power and learning ability (Alvarez & Barney, 2001; Das & He, 2006) as well as resource endowments, size, and business experience (De Groot & Backmann, 2019; Fortwengel & Sydow, 2018; Hogenhuis, Van Den Hende, & Hultink, 2016; Minshall et al., 2010) that exist between long-established firms and young ventures. Furthermore, because they are aimed at generating new ideas through collaborations between firms from diverse knowledge domains that act as “disciplinary specialists” (Nicolini et al., 2012), to avoid failure (e.g., Zuzul, 2019) these relationships require firms’ ability to combine resources from both

sides in novel ways (Deken et al., 2018), speak the same language (Carlile, 2004) and develop mutual understanding about the collective task to be accomplished (Bechky, 2003; Majchrzak, More, & Faraj, 2011; Seidel & O'Mahony, 2014).

Against this backdrop, scholars are increasingly pointing at the critical role that external intermediary or mediating organizations may play to help distant firms such as large incumbents and young ventures identify collaborative innovation opportunities, forge inter-organizational linkages, and effectively exploit the benefits of co-exploration and cross-disciplinary fertilization. Scholars interested in investigating “when and how the enterprise ought to form alliances with other organizations” (Teece, 2012): 1395), for instance, have emphasized that organizations such as network orchestrators have an essential role in helping firms develop sensing capabilities by connecting them with potential partners, and enable them to assess their complementarities even when expectations are not clarified upfront (Giudici et al., 2018). This is the case, for instance, of organizations such as business incubators, regional institutions, and venture associations. Others have referred to the need for firms to forge relations with new partners and enter multilateral collaboration arrangements (Ansari et al., 2016; Davis, 2016; Deken et al., 2018) to develop and legitimize innovations.

This important yet under-developed conversation has remained still relatively silent, however, on the role that these third-party organizations may play beyond creating linkages among organizations. We still know little about how these emerging yet important intermediaries perform the boundary work that is needed to facilitate the pursuit of innovation across organizational as well as disciplinary boundaries in settings where “innovation is desired” (Carlile, 2004: 555).

Boundary work and boundary organizations in inter-organizational relations

Boundary work is the “purposeful individual and collective effort to influence the social, symbolic, material and temporal boundaries, demarcations and distinctions affecting groups, occupations and organizations.” (Langley et al., 2019: 5) It refers to agentic efforts by various subjects to help independent parties (be them individuals, groups, or organizations) to overcome

the challenges of collaborating across boundaries. When boundary work is aimed at affecting the boundaries of others to enable and “accomodate collaboration among organizations from incompatible social worlds or/and actors with competing interests” (Langley et al., 2019: 722) by working from *outside* – and thus *through* the boundaries of others – it is performed by a particular type of intermediaries defined as boundary organizations (e.g., Guston, 2001; Langley et al., 2019; Miller, 2001; O’Mahony & Bechky, 2008; Perkmann & Schildt, 2015).

The concept of boundary organizations has first originated from sociologists of science to describe organizations standing in-between scientists and politicians – such as Technology Transfer offices (Guston, 1999) – whose role was to facilitate collaboration processes among them by changing their ability to collaborate “for mutually satisfying ends.” (Guston, 1999: 105). Boundary organizations are skilled mediators which, by being part of “a triadic role structure” (O’Mahony & Bechky, 2008), stand in-between “unexpected allies” (O’Mahony & Bechky, 2008) to allow them to collaborate and realize mutual goals while protecting their interests and remaining independent organizations (e.g., Langley et al., 2019; O’Mahony & Bechky, 2008). Example of settings where boundary organizations have enabled independent firms belonging to diverse expertise domains to collaborate for mutual gains include collaboration between scientists and governments (Guston, 2001; Miller, 2001), universities and other institutions (Parker & Crona, 2012; Perkmann & Schildt, 2015), and open-source projects and commercial firms (O’Mahony & Bechky, 2008).

Despite such conceptualization is important to describe the work that many organizations do to enable collaboration between different actors, the scholarly conversation about boundary organization is still scarce, and this body of research presents some under-theorized areas. First, although the notion of boundary organization fits with any organization that, standing in-between parties from diverse domain, enable them to collaborate by accommodating their divergencies and allowing the pursuit of multiple (and mutual) goals, very limited evidence on boundary organizations exists outside the science vs politics domain (see O’Mahony & Becky, 2008, for an

exception), overlooking other important – and equally challenging – collaboration settings. Second, despite boundary work has been theorized as being dynamic, processual and “in flux” (Langley et al., 2019: 5), and configurational boundary work has been defined as happening from outside collaborations, boundary organizations are mostly examined as static, enduring entities – sometimes even created by the parties themselves – rather than as independent, supporting organizations that reside outside the involved firms and which can be called upon on a temporary basis and only when needed. Third, while available studies have mostly elicited the critical role that boundary organizations play in the governance of inter-organizational relations, the dynamics of mediated collaborations and the boundary work (Langley et al., 2019) that these organizations play in the formation and management of exploratory inter-organizational collaborations across domains is still under-theorized. By focusing almost exclusively on governance, scholars have overlooked other essential aspects of the boundary work that these organizations perform, such as supporting the creation of innovation to which many inter-organizational relations are aimed at (Davis, 2016, Powell et al., 1996).

We still have a limited theoretical understanding on the mediating role of boundary organizations in inter-organizational relations, especially when the collaborating parties are committed to generating innovative outcomes through collaborations across organizational as well as disciplinary boundaries – as in the case of most collaborations between large incumbents and new ventures. Specifically, we know little about the processes and underlying mechanisms through which organizations working at the boundary between organizations from diverse knowledge domains enable and assist them in finding one another and enacting opportunities for collaborative innovation, as well as about the temporal dynamics of such collaboration processes.

METHOD

Research context: Corporate-startup collaborations in the Fashion Industry

To explore how boundary organizations assist firms from different industries in exploring innovation opportunities through collaboration, we studied an open innovation initiative called

Exploration program that brought together a well-established fashion firm – a luxury firm with more than 2400 employees at the time of our study – multiple digital startups, and an open innovation intermediary active in strategy and innovation consulting. When we began this research, we hoped to explore how intermediary or mediating organizations help incumbent firms in traditional industries renovate themselves by collaborating with new technology ventures. The fashion industry proved to be an ideal context for this study. First, due to the profound implications of the rise of digital technologies on fashion consumers and brands' operations, fashion firms are increasingly looking for young ventures at the forefront of digital innovation to collaborate with. Fashion brands are initiating collaborations with technology startups to solve issues such as, for instance, manufacturing automation, products' traceability, enhanced customization, and communication with digitally-native consumers. Industry reports depict collaborations between incumbent fashion brands and young digital ventures as “the way forward” (The Business of Fashion & McKinsey, The State of Fashion 2019) for fashion incumbent brands to keep the pace with a rapidly demand landscape and remain competitive in the long run. As one of our informants told us when we began this study:

“It is a mix of us evolving and the environment evolving as well. We are in a moment where for multiple reasons, there are a lot of very interesting startups in fashion and retail, which was not the case three years ago ... because the startups were not so much interested in this area, also probably because the luxury companies were not interested in startups, and finally because the investment funds and the venture capitalists were not either ... I mean, traditionally they have been very reluctant with whatever touches fashion because fashion is unpredictable ... but now, because there have been several success stories, there is growing interest. So the startups developing verticals around fashion and retail and luxury is becoming much broader and much more complex.” (Head of strategy, FashCo)

Corporate-startup collaborations are challenging per se (e.g. Alvarez & Barney, 2001; Katila et al., 2008; Minshall et al., 2010), and even more so when involving organizations as culturally and operationally distant as large fashion incumbents and new technology ventures. As recently

reported on a fashion and retail investment fund's blog: "Tech and luxury have not traditionally been the closest of allies."³²

Most fashion brands are approaching collaborations with startups for the first time, and are still lacking both partner networks and appropriate technological competences to effectively assess the landscape of startup companies they might partner with. For this reason, fashion firms are increasingly turning to external intermediaries or mediating organizations to help them reach out with relevant startup companies, explore potentially disruptive technologies, and leverage on collaboration to integrate these technologies into their internal processes. Organizations such as innovation consultancy firms and business accelerators, therefore, are increasingly valuable partners for fashion brands and startups developing technologies around this industry to help them forge mutually valuable partnerships and quickly experiment with technology integration opportunities by combining their different resources and domains of expertise to come up with novel solutions. As we got access to one of such organizations, we saw an opportunity to advance research on boundary organizations – an important yet undertheorized field of research in management and organization studies (e.g., O'Mahony & Bechky, 2008) – by exploring how they enable actors coping with very different organizational structures and used to distant operational modes generate innovation across organizational as well as disciplinary boundaries.

Research setting: The Exploration program

Due to the still scarce availability of research on the role of boundary organizations in the creation of innovation, we adopted an inductive approach for this study (Edmondson & Mcmanus, 2007; Eisenhardt, 1989). Motivated by the aim to provide a "thick, detailed descriptions of actual actions in real-life contexts" (Gephart, 2004: 455), our research strategy was based on a field study. Our research setting is an open innovation programme called 'Exploration programme' between an Italian open innovation consultant (from now on, 'HubCo'), a leading multinational company

³² Full article available at <https://true.global/true-talks/rich-anson-meets-david-grunwald/>, accessed July 24th, 2019)

in the fashion industry (from now on, 'FashCo' or 'the company'), and a group of digital startups. We use pseudonyms instead of real names of the companies to protect the anonymity of the involved organizations. Our study offers an in-depth analysis of the Exploration programme, which HubCo has designed and managed.

The Exploration programme was designed by HubCo, a former venture accelerator that has now become a “kind of hub” (from HubCo website, accessed January 6th, 2018) helping “companies in the implementation of digital processes” (HubCo website), and began on July 2017. It started as a collaborative strategic initiative between FashCo and HubCo, with the aim of scouting and selecting a group of digital startups with whom FashCo could collaborate through some pilot projects aimed at integrating the startups' technology solutions into its operational processes, and potentially create longer-term collaboration opportunities.

The exploration program is a compelling setting to analyze how boundary organizations enable exploration and support the creation of innovation across expertise domains. When the initiative started, FashCo had no clear ideas as for what technologies they were looking for and who would have been involved in the program, which startups they wanted to meet and initiate a collaboration with, how long the collaborations would have lasted, and which integration opportunities they could explore through collaboration. As our informants remarked, FashCo started with the idea of using HubCo support to help them be “*eyes-open on the world outside*” (FashCo, CEO), and make sure that they would not miss “*trends that may radically transform their industry and what they are doing.*” (HubCo, director). By the end of the program, largely due to the critical and ongoing support provided by HubCo throughout its development, FashCo had gone from an initial selection of over 150 startups developing a range of different technologies to the initiation and successful completion of two experimental collaborations with two of them. As a formal partner for all involved actors throughout the whole process of collaboration, HubCo took an active stance in enabling them to understand how they could leverage on their differences to create mutual value (e.g., O'Mahony & Bechky, 2008). They, for instance, formalized FashCo's technology interests

and directed the search for potential partners accordingly, helped FashCo's members and startups' entrepreneurs communicate and agree on reciprocal expectations, and actively monitored the development of the experimental collaborations upon their completion to make sure that both partners would deliver on their promises. Throughout the program, the participating firms combined activities performed together with others performed autonomously, and largely interacted over about one year. Such a peculiar setting allowed us to transparently observe (Pettigrew, 1990) how HubCo, serving as boundary organization between the fashion company and the startups, enabled and assisted the collaboration process between them, and fostered the emergence of innovation opportunities across organizational as well as disciplinary boundaries. Furthermore, the Exploration programme has now evolved into an enduring partnership between HubCo and FashCo, which we interpret as indicative of its success.

Data collection

HubCo granted us access to both primary and secondary data (see Table 1), allowing us to follow the development of the programme over approximately 12 months. We collected longitudinal data following the inception and development of the programme in real-time, observing events as they were unfolding. During the program development, from July 2017 to June 2018, the first author observed 70 hours of collaborative activities between HubCo, FashCo, and startups. She attended the most important meetings and events whenever she was allowed to participate as a non-participant observer, and took extensive notes trying to capture as much dialogue and observations of the interaction between the involved companies as possible. As she gained trust from HubCo members and familiarized with the empirical context, she also had many opportunities to informally chat with HubCo and FashCo employees, as well as entrepreneurs (for instance, during lunches, dinners, or networking events) and share their impressions on events in real-time. To further familiarize with the empirical context and engage in informal conversations with members of the involved organizations, both authors also attended events organized and hosted by HubCo as part of the activities of the open innovation unit that were not part of the

Exploration program (such as specific events for managers aimed at disseminating knowledge about emerging technologies or industry-focused symposia aimed at discussing technological trends). Observations and conversations were audiotaped whenever possible, and always documented through extensive notes.

We also collected 46 interviews (34 formal and 12 informal) with our informants, in two rounds. All interviews lasted between thirty minutes and two hours, and were audiotaped and transcribed verbatim. In the first round (from July 2017 to October 2018), while the program was ongoing, we complemented our fieldwork with 23 interviews (13 formal and semi-structured, and 10 informal) covering the whole range of actors involved in the program – including corporate members, HubCo open innovation unit employees, and entrepreneurs whose companies had been selected to collaborate with FashCo on experimental projects. We conducted interviews based on a shared interview guide and adapted the guide's structure according to each informant's role. We started all interviews by gaining a general understanding of each informant role in its company and in the program, as well as its interpretation of the main motivations behind the initiative. We also asked informants to recall what happened during specific events, as well as why they decided to enter the collaboration. When interviewing HubCo members, we focused on understanding what was their role at each stage of the process, which activities they were doing, what happened during meetings and collaborative activities with FashCo and the startups, and why they thought their presence was important in each stage. When interviewing corporate members and entrepreneurs, we focused on the motivations underlying the initiative, the dynamics of collaboration and interaction with HubCo, and their interpretation as for how HubCo supported them during its development. We also asked questions about their reciprocal interactions, their feelings and emotions during the process, how they identified the specific projects on which they had been working, which issues they had been facing, and how the collaboration was managed. The informal interviews were conducted with HubCo's program manager and were primarily aimed at discussing the program's advancements, deepening observations, and clarifying emerging issues.

In the second round (from October 2018 to October 2019), we collected other 24 interviews (21 formal and two informal) with both program participants and other organizations offering services to established firms similar to what we had been observing at HubCo. The interviews with the program participants were aimed at understanding how their relationship had evolved after the initiative and what they had learnt from the experience. We used the interviews with managers of similar organizations who had been offering similar programs to other companies to triangulate our data, ensure generalizability of the patterns we had been observing, and ultimately confirm findings for the first round of data collection. During the informal interviews, we also shared our preliminary interpretation with insiders (one manager and one specialist at HubCo) to get their feedback and ensure that the theoretical model we were developing captured the progression of the initiative as experienced by our informants.

To supplement the primary data, we collected and analyzed a wide array of secondary data to which HubCo granted us full access. These included program reports and artefacts (such as post-it and billboards), as well as publicly available documentation such as podcasts and press news covering all firms involved. Table 1 describes our data sources and how we used them in the analysis.

-----INSERT TABLE 1 ABOUT HERE-----

Data analysis

Following prescriptions for grounded theory research (Locke, 2001), data collection and analysis were performed as interrelated processes. We relied on multiple strategies for the analysis of our longitudinal data (Langley, 1999). Data analysis unfolded in four steps that we performed iteratively and repeated multiple times and which, for the sake of clarity, we present sequentially.

Step 1. Building an event chronology and visual mapping. As soon as we started collecting the data, we engaged in an ongoing process of reconstruction of each phase of the program, using evidence coming from observations, interviews and internal documentation (see Figure 1a, 1b, and 1c). We used observational data to reconstruct events and micro-actions within

events as we saw them unfolding, and triangulated these data with interviews and notes from meetings with HubCo's program manager to add information we were not able to observe directly. We triangulated these primary data sources with program-related documentation – such as project plans and emails – to refine the reconstruction with additional details (such as who precisely was involved in what and how people interacted both on- and off-site). Even though these event reconstructions were “simply pure descriptions” (Eisenhardt, 1989: 540), they were critical “data organization devices” (Langley, 1999: 695) for subsequent analysis. The event reconstruction was used as a basis for the construction of a detailed timeline (Langley, 1999; Langley & Truax, 1994) and graphically represent our analysis in a process flowchart (Langley & Truax, 1994).

Step 2. Open coding of challenges, practices, and outcomes. While reconstructing events and building the process flowchart, we noticed that HubCo was assuming evolving roles and performing different activities at each stage of the process. While during the setup phase their role was primarily that of clarifying FashCo's innovation needs, co-defining which kind of startup companies would best address those needs, and engaging in first-hand search for potential partners, for instance, later in the process they were less involved in the actual execution of the program and shifted their activities to mediating interactions between the collaborating actors, organizing workshops and meetings, collecting feedback, and coordinating activities. Based on these differences, we “bracketed” (Langley, 1999: 703) events along the chronology into three discrete and subsequent phases, which we refer to as setup and screening, assessing and brainstorming, and converging and testing. We labelled each period in accordance to our interpretation of the collective, higher-level objective of that particular period, based on the relative homogeneity of activities within a specific time interval, and relative heterogeneity across different intervals. We then got back to the raw data and engaged in open coding following common prescriptions for grounded theory building (e.g., Locke, 2001). We engaged in multiple rounds of detailed reading of our interviews, notes, and secondary data, and assigned in-vivo labels to paragraphs, remaining as faithful as possible to the worlds of our informants. We focused on uncovering the issues that

the collaborating organizations were facing at different points in time, the activities that led these criticalities towards resolution, and the consequences for the participating firms and the evolution of the program more in general. Coherently with our interpretive approach (Gephart, 2004), we approached the data without theoretical pre-conceptions in mind, to allow relevant themes to arise from the data inductively and based on the words of our informants. It was at this point that most issues related to boundary spanning and difficulties in collaborating across domains started to arise and directed us towards theories of boundary organizations.

Step 3. Collapsing open codes into emergent theoretical categories. At the end of the previous round of analysis, we had a large number of open codes reflecting the lived experiences of our informants. To move from this large set of codes to a more manageable number of meaningful theoretical categories, we collapsed similar codes onto first-order categories (Gioia, Corley, & Hamilton, 2013), and went back to theory to illuminate our emerging interpretations and seek for explanations. For instance, we used theories on boundary organizations to make sense of the “organizational mechanisms and processes that enable collaboration” (O’Mahony & Bechky, 2008: 426) and that were primarily performed by the digital hub firm, as well theories of boundary spanning (Leifer & Delbecq, 1978; Levina & Vaast, 2005; Pawlowski & Robey, 2004) and collaborations across domains (Bechky, 2003; Boland & Tenkasi, 1995; Carlile, 2004; Zuzul, 2019) to inform our analysis of the participating firms’ attempts at working together and understand each other. We, for instance, collapsed open codes such as “*organizing things to do*”, “*emphasizing fast implementation*”, and “*managing program timing*” into the dimension of “*dictating temporal pace*”. Similarly, codes such as “*discussing first impressions*”, “*arranging meetings to discuss preferences*”, and “*leading discussions during summits*” were merged as “*creating spaces for dialogue*”. While moving back and forth between data and theory, we used the process flowchart to map and count which codes occurred in the different periods, and constructed a large table to compare the occurrence of different codes and the organization they were referring to within each period. Through this mapping and counting exercise, we developed a matrix that shows the prevalence of actions and practices enacted by

FashCo alone, HubCo alone, and the startups alone, as well as collaborative ones. Figure 2a³³ and 2b offer a graphical representation of these analyses. The detailed data structure resulting from our analysis is depicted in Appendix 1.

-----INSERT FIGURE 2A ABOUT HERE-----

-----INSERT FIGURE 2B ABOUT HERE-----

The matrix and its graphical representation allowed us to see when the role of HubCo was more or less critical throughout the process, as well as to observe different levels of participation of the collaborating firms at different stages. This analysis revealed an interesting pattern of relative presence and absence of each category of actors at different stages. For instance, while HubCo was largely present at the beginning of the program (when their role was critical to understand FashCo's needs, design the activities to be done accordingly, and scout for potentially relevant startups), its role became gradually less critical during the use case definition stage, when HubCo and the startups had to come up with ideas by discussing among themselves; it then returned critical during the pilot design stage, when these ideas needed to be transformed into concrete action plans, and again less critical during the implementation stage, where HubCo's role became again that of an orchestrator and facilitator of activities primarily performed by FashCo and the selected startups. Furthermore, looking at whom HubCo interacted more with at different points in time, we noticed that while they largely interacted with FashCo at the beginning of the program (and not with the startups), such interaction gradually disappeared over time to leave room for more interactions with the new ventures towards the end of the process. Furthermore, while at the beginning of the process HubCo was by far the most prevalent actor compared to FashCo and the startups, at the end of the process we noticed the opposite case: HubCo's role becomes comparatively less important and the interactions between FashCo and the startups themselves become prevalent. We interpreted this pattern of relative absence and presence of HubCo at

³³ The acronyms 'SS', 'AB', and 'CT' used in Figure 2A refer to the macro-phase of the collaboration process as depicted in the findings section. SS = setup and screening; AB = assessing and brainstorming; CT = converging and testing.

different stages of the process as one of “morphing”, which describes the evolutionary transformation of HubCo’s role and importance over time depending on the stage of collaboration. At this point, we then went back to our open coding to better understand why such morphing took place.

Step 4. Building a process model. To uncover relations among concepts and build a process model fitting our evidence (Locke, 2001), we connected the mapping and counting of open codes with the theoretical dimensions and aggregate dimensions they were referring to as identified through multiple data-theory iterations. Before assembling our interpretations into the final process model, we tested alternative frameworks (Locke, 2001) and submitted our provisional interpretations to key informants at various stages of the analysis (Yin, 2013). These feedback meetings were useful to validate our emerging interpretations and refine the model. Eventually, we assembled our evidence into a process model of how HubCo evolved and morphed its role as it enabled and assisted collaboration between FashCo and the startups, portrayed in Figure 3.

FINDINGS

Phase 1 (Setup and screening): Exploration and the emergence of strategic ambiguity

Starting exploratory, collaborative projects is never easy (e.g., Deken et al., 2018; Zuzul, 2019). When the Exploration program started, neither FashCo nor HubCo had ever run a program of this type – HubCo was formerly an accelerator and was about to start offering open innovation programs, and FashCo was just approaching open innovation and had almost no experience in collaborating with startups, especially tech ones. As FashCo’s head of strategy told us: “*The idea of this program ... is to see things coming to us that were not anticipated*”; similarly, a member of HubCo’s open innovation team explained: “[*the aim was*] *to see whether there is something cool out there.*” Although they both generally agreed that the objective of the whole initiative was to explore potentially relevant technology ventures for FashCo’s business and initiate collaborations with the startups developing them, they had no clear idea as for what exactly they were looking for, how long the collaboration

would have lasted, and which technology integration opportunities they might have explored.

FashCo head of strategy explained:

“We met HubCo because their story was very interesting, and we liked the approach, and we liked the people, and we discussed what they were doing with startups and we said ‘that’s interesting, let’s try’. But it was not strategy.” (Head of strategy, FashCo)

The exploratory nature of the program gave rise to a form of ambiguity which we refer to as strategic ambiguity (Table 2): a lack of a clear strategic direction as for what the goal of the collaboration might be – as reflected in, for instance, a lack of clarity about what the strategic priorities might be – which in turn leads to a multiplicity of possible paths along which such goal might be created and pursued. Our informants explained this strategic ambiguity:

“We started from a brief with HubCo that was quite broad ... we said ‘ok, let’s take a broad area and let’s see what comes out.’” (program manager, FashCo)

"[FashCo wanted] to see whether there was something cool out there." (open innovation team member, HubCo)

-----INSERT TABLE 2 ABOUT HERE-----

Strategic ambiguity, in turn, called for HubCo’s intervention to set the stage for the initiative to begin. Because HubCo and FashCo’s domains of expertise were very diverse, the program started with a process of mutual acquaintance and reciprocal adjustment – which we refer to as setup and screening – that unfolded in two distinguished moments. First – during the programme setup – HubCo and FashCo collectively figured out which strategic objectives FashCo wanted to achieve, HubCo designed the program roadmap accordingly, and both agreed on a brief to orient the search for potential partners afterwards. Then – during the search and screening phase – HubCo scouted potential partners for FashCo according to the previously agreed program brief and created a shortlist of potential collaborators. Figure 1a displays the event chronology of the setup and screening phase. Next, we elaborate on how such mutual acquaintance and collective agreement were achieved.

----INSERT FIGURE 1a ABOUT HERE-----

Solving strategic ambiguity through cross-domain framing work

We observed that HubCo did a number of actions to overcome strategic ambiguity and clearly set expectations from both parties in order to provide direction for subsequent activities. We label the boundary work that HubCo performed in this phase cross-domain framing work. Cross-domain framing work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise enable the formation of inter-organizational relations by gathering knowledge about prospective partners, and combining it with their own knowledge in order to frame expectations for the prospective collaboration in a way that is: i) understandable for each party; and ii) aligned with the prospective partners' strategic direction. We conceptually organized the mechanisms underpinning cross-domain framing work around three dimensions: sharing reciprocal knowledge, framing expectations, and sharpening search focus. As a member of the open innovation unit at HubCo summarized:

“That was initial strategy work, sort of figuring out what the challenges were and how exactly they could benefit from startups.”

Sharing reciprocal knowledge. When the program first started, HubCo and FashCo were experts in their respective domains (the fashion industry one case, technology ventures in the other) but relatively novices in the domain of the other. HubCo was conscious of the need of lowering such domain-specific differences and developing a boilerplate language (e.g., Carlile, 2004) to identify what FashCo was looking for correctly, and co-design a scouting brief that could orient HubCo's search efforts towards the correct potential partners. They invested time and effort gathering knowledge about both FashCo and its industry, in order to first produce “*a list of themes ... based on macro trends in fashion and retail*” (team member, HubCo) that may have guided the search for potentially relevant startup companies with whom FashCo could initiate a collaboration, as well as the critical issues FashCo was struggling with that needed to be solved. They “*collected information about trends in the luxury fashion business*” (head of scouting, HubCo), and spent time understanding

the specific language used by a fashion firm – i.e., learning “*how [FashCo’s people] call things*” – and updating their vocabulary in order to avoid misunderstanding moving forward. As HubCo’s program manager recalled: “*Sometimes the discussion was like ‘ok, this is the same thing, you call it this way, we call it this other way, ok let’s frame it this way.’ And then during the discussion, it was all about understanding what they meant by everything specifically.*” FashCo program manager echoed:

“We wanted to immerse [HubCo] in our world.”

To gain such industry- and company-specific knowledge, HubCo engaged in activities such as involving an expert in the Fashion industry in the challenge definition and scouting phases, running a collaborative workshop with FashCo’s management team to do “*a full immersion*” (program manager, FashCo) into the strategic initiatives they were undertaking, and gathering as much information as possible about whether and how FashCo’s employees ever had any experience in working with new ventures before, which was necessary for HubCo to understand how they could add value to future collaboration opportunities. FashCo’s program manager, for instance, recalled that they were asked “*to give [HubCo] visibility on the startups [they had] already met in various fields ...*”, and HubCo’s program manager emphasized that it was important for them to understand whether FashCo’s employees were “*used to talk with startups already*” in order to know “*what they found so far*” and to “*try to give [FashCo] a framework to understand how we could create value.*”

The members of HubCo’s open innovation team actively engaged in sharing information about their own knowledge and activities as well. They, for instance, shared detailed information with FashCo about the different types of programs they could do for them, as well on the methods used in each program type. They, for instance, engaged in explanations and discussions about the differences between “*startup pilot*”, “*pilot evaluation*”, and “*pilot acceleration*”, as well as on the different stages, performance indicators, and “*typical outcomes*” (HubCo Innovation Exploration kick-off presentation) of each program type. As a FashCo employee summarized: “*As we were working together there has been a fine tuning process... an alignment process.*”

Framing expectations. HubCo team members spent time making sense of FashCo's "vague ideas" (open innovation team member, HubCo), understanding what they expected to achieve from the program, and translate such expectations into a program design that could satisfy the interests of the multiple involved parties. Selecting the right programme path, and designing the activities to be done accordingly, was critical to increase the likelihood of success of the whole initiative. As the program manager at HubCo told us: "*We met with [FashCo], and we reflected with them about what they needed, what they expected from these technologies, what they wanted to do. That is when we defined the activities that we were going to do for them.*" Another informant echoed this idea, explaining that "*most of the times they have vague ideas, and it is our job to make them become concrete challenges.*" Only after HubCo had gained a clear understanding of what FashCo was looking for they were able to structure their collaboration around a shared set of objectives, select the best fitting people for the program teams, and agree on a precise program timeline. As HubCo's program manager explained:

"We helped them structuring their reasoning because they're not that structured, so we tried to understand what they wanted to achieve ... based on this understanding, we told them 'all right, based on what you said, perhaps you might be interested in this, what do you think?', 'yes, perhaps' ... and this has gone on until we found an agreement so that we were all like 'ok, this is going to be the program.'" – Program manager, HubCo.

Sharpening search focus. After the objectives of the programme and expectations had been clarified, HubCo could begin searching for potential partners to match with FashCo's needs. FashCo and HubCo were both involved in defining a list of areas on which the search would have been based, that served as a guide for HubCo to perform the scouting within a clear, sharpen scope. To make sure that this search results would have met FashCo's expectations, HubCo spent time discussing what they were hoping to find and encouraging FashCo's team to reflect and correctly assess the strategic priority of different needs. As an open innovation team member at HubCo explained:

"They gave us a list [of potential problems]. For instance, within retail, they were looking for sizing solutions ... they were also looking for something to improve communications between the sales associates and managers ... and they were also looking for solutions to be applied to physical stores. And then another

problem they have is how to manage returns. These are problems for them because there are many inefficiencies in the industry. So this was all about understanding, you know, ‘in retail, what are you interested in exactly?’ [...] So ‘I’m interested/I’m not interested’, and if you’re interested, how much are you interested? And how much compared to all other things?’”

They defined the scouting areas based on “*two lists, one prepared by us and one prepared by them*” (program manager, HubCo), collapsed them together, and helped FashCo assigning a priority order. Through multiple iterations and discussions, these ideas became concrete search criteria – including specific search themes, and main characteristics of the startups they wanted to find – which in turn guided HubCo’s search endeavour through its proprietary connections and methods. As a result, HubCo created a database of more than 150 potential collaborators in three different segments (retail, online, and after-sales) and 17 areas within those segments (ranging from “*payment systems*” and “*in-store traffic*” to “*social commerce*” and “*shipping and logistic optimization*”), collected information about the ventures’ technologies, team members, previous collaborations, funding, and growth stage, assessed each startup relevance according to their interpretation of FashCo’s interests, assigned different scores to them on the basis their evaluation of each venture’s innovation potential, and eventually created a shortlist of 42 potential partners and a summary report to be presented to FashCo for further scrutiny. Mixing HubCo open innovation team’s domain-specific knowledge about how to assess a startup potential, together with FashCo’s insights and technology interests as reflected in the scouting brief, HubCo was able to scout promising startups that might have matched FashCo’s needs, and eventually presented the report during a dedicated meeting, which we have identified as a turning point for the beginning of the next phase.

Cross-domain work leads to the emergence of a boundary-spanning unit

Because the Exploration program started under conditions of strategic ambiguity – that is, a lack of clarity about what its goal might have been, and a multiplicity of possible paths along which the collaboration could have gone ahead – the knowledge exchange and framing work underlying its initial phase called for a high level of involvement of FashCo employees and managers from different business units within the company, in order for them to share their critical

issue and define each business unit's strategic priorities. As some informants at FashCo remarked: *“if we are to have a real evaluation, we have to open the evaluation team to the people that are going to work directly with startups”* (project support, FashCo), and similarly: *“we try to cover all functions, so that then everyone can collect inputs.”* As the program manager at HubCo recalled:

“This is a strategic project. So the strategy team involved people from many departments. There was somebody from the creative side of the business, somebody from omnichannel, digital... and so on. These people were there at every meeting afterwards... so they brought together a diverse team.”

Because many people needed to share their ideas in order to define the strategic priorities, HubCo took an active stance in advising FashCo about who should have been involved, and how to foster the engagement of different people within the company. FashCo's program manager explained:

“We have involved the business units together. [HubCo] provided advice as well with regards to who should have been involved. We really discussed with them, and it was really collaborative ... and surely, involving the business units and not limiting the discussion has been critical.”

The gradual advancement from a multiplicity of possible paths to a more refined search focus that happened throughout the setup and screening phase, in turn, fostered the emergence of a formal boundary spanning unit composed of representatives from different functions within FashCo, called *“startups evaluation committee”* – *“a fixed group to frame the roadmap and prioritize the main areas where we want to scout”* (head of strategy, FashCo). The startup evaluation committee had an essential role in the development of the program moving forward. It served as the primary interface for HubCo, as well as an evangelist of the initiative among FashCo employees, in order for them to engage with the program's goals and commit to its successful realization. It also enabled different people to familiarize with the issues other business units were facing, get to know other people within the company and be exposed to innovation ideas falling outside the scope of their daily activities. FashCo program manager remarked:

“What happened in this project between us and [HubCo], was the involvement of the business units themselves, which is something that is not obvious ... I mean, the most concrete functions like merchandising, or visual merchandising ... they are not used to work with startups, and their approach is very different. So having them involved and having their support has been crucial.”

Phase 2 (Assessing and Brainstorming): The emergence of matching and task ambiguity

At the end of the setup and screening phase, FashCo was provided with a list of 42 startup companies (potential collaborators), organized around the macro areas of innovative technologies for retail, online, and after-sales. During the second stage of the program, which we refer to as assessing and brainstorming, FashCo evaluated the potential startups partners that HubCo presented them, selected the most interesting ones, and figured out – together with the startups – what the use cases may have been for the integration of the startups’ technological solutions. Figure 1b displays the event chronology of the assessing and brainstorming phase.

-----INSERT FIGURE 1b ABOUT HERE-----

Despite the cross-domain work HubCo had done in the previous stage – which was critical to move from a completely open global search to a manageable list of potential partners – when this second phase began FashCo’s startups’ evaluation committee was still far from selecting the startups they may have initiated a collaboration with. Having multiple people on board and collecting many ideas was a pivotal aspect of the exploratory nature of the initiative, but it also created some troubles when it came to moving from open scouting to the initiation of actual collaborations. The central goals of the program around “*innovation discovery*” – that is, “*explore and test concrete solutions*” – and “*tech discovery*” – i.e., “*considering adoption of emerging tech solution*” (exploration program kick-off presentation) – did not entail any well-articulated technology integration opportunity upfront. Our informants described such lack of clarity about what exactly they were looking as well as whom they wanted to work with stating that their knowledge “*was still high-level at that time*” (program manager, HubCo) and that they “*had just a very general overview*” (employee, FashCo). Other informants echoed these ideas, stating that “*opportunities are what we are looking for*”

(head of scouting, HubCo) and explaining that at that stage “*there were just so many things, so probably for [FashCo] this was a sort of overview of everything that one can do in the retail world, rapid, very general, but with many ideas and many potential reflections, without being a hundred percent clear about what could possibly become a pilot and then perhaps a project.*” (entrepreneur). Similarly, a corporate informant described how they found themselves confronted with “*25 startups claiming they do more or less the same thing, and of course, each one will tell you they are the best.*” (head of strategy, FashCo)

This lack of clarity about which collaboration outcome the different members of FashCo evaluation committee was looking for, in turn, gave rise to two new and interdependent forms of ambiguity, which we refer to as task ambiguity and matching ambiguity (Table 2). Task ambiguity refers to a lack of clarity about which specific output the collaboration is formed to accomplish. While discussing what they could potentially do image recognition technologies, for instance, FashCo’s head of strategy answered:

“We are so much working with pictures in many areas in the company... the kind of things you can do if you are able to recognize pictures... I mean, there are hundreds of use cases.”

Since tasks are critical for evaluating resource complementarity – a critical criterion for the formation of inter-organizational relations (Furlotti & Soda, 2018; Soda & Furlotti, 2017) – task ambiguity led to matching ambiguity: a lack of clarity about who the best partner may be to realize a desired collaborative output. Both kinds of ambiguity, in turn, were exacerbated by FashCo’s lack of expertise in collaborating with technology ventures, which called for HubCo intervention to be solved. One of our informant, expert in consulting established fashion companies, explained this additional difficulty as such:

“Those kind of individuals are not full time working or focusing on which startups they should work with, that’s just part of their job, and for the majority of them that’s a small part of their job. Being able to understand at a quick glance who is a natural fit for the brand and who isn’t is very, very difficult.”

Solving task and matching ambiguity through misaligned translation work

In response to task and matching ambiguity, HubCo had yet a critical role in enabling both FashCo and the startups to establish a dialogue among each other and figure out together whether, how, and why they could initiate a collaboration. In order to provide such support, HubCo performed a variety of activities through which they offered their specialized knowledge of “*the startup world*” (HubCo, program manager) to FashCo startup selection committee, and assisted them in understanding the startups’ technological solutions in order to select the best matches. They also helped the startups themselves to effectively pitch their ideas, and finally guided both partners towards the definition of the use cases to be addressed with the pilots. We refer to the boundary work that HubCo performed in this phase as misaligned translation work. Misaligned translation work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise engage in shaping the collaborating parties’ knowledge boundaries, in order to create the condition for them to communicate with each other effectively. We conceptually organized the mechanisms underpinning it around the dimensions of offering complementary knowledge, creating spaces for dialogue, and mediating prospective resourcing.

Offering complementary knowledge. When first confronted with the need to select which ventures they wanted to meet, the members of FashCo’s startups’ committee lacked sufficient domain-specific accumulated knowledge (Carlile & Rebentisch, 2003) to understand both the technology and the characteristics of the startup developing it. In response to this issue, on multiple occasions, HubCo offered its specialized, complementary knowledge of startups to guide the corporate in the evaluation of potential partners. FashCo head of strategy explained: “[HubCo] brings you visibility on what other companies are doing with technology. Because I mean, thinking about technology - regardless of whether we are talking about luxury or a specific function - what applies to others can also apply to you. So, [HubCo] also brings you the experience of other industries, how you can apply it, which may not be straightforward.” HubCo gave suggestions on collaboration opportunities, and provided “*inputs*” (program manager, HubCo) on the factors that – according to them – FashCo should have taken into account, because “*a startup might look good on the surface, but their offer might not be ready, or the offer*

can be ready but nothing really new.” (program manager, HubCo). As one informant recalled, HubCo open innovation team members “*tried to describe to [FashCo] everything we know about startups.*” (program manager, HubCo) As explained by HubCo open innovation director:

“This is not just smart procurement. We have to make them understand the ideas, the trends... we have to make them understand the startup world, even if they are startup-agnostic.”

This complementary knowledge, in turn, was important for FashCo to effectively select the best partners and figure out what the best technology integration opportunities might have been – as one informant explained: “*whereas we see the house and they can see the foundations, they can say ‘ok, based on these foundations you can do a house that looks completely different.’*” (head of strategy, FashCo). As some informants summarized:

“[The value] comes from understanding startups, understanding who can execute and who cannot, understanding you know, ‘are they moving in the right direction?’, ‘do they have a solid foundation?’, ‘are they the right type of fit for the company?’ So these are all different variables that we evaluate before we come up and say ok, here’s the twenty that we think that you should meet, and then at the end of that process we can say ok, these are the two that we think you need to be partnering with.” (open innovation director, HubCo)

“Because they have a clear experience [...] we see very clearly where is the value, what is it that they bring us, that in any case, we cannot bring ourselves.” (head of strategy, FashCo)

Creating spaces for dialogue. The assessment done by FashCo and HubCo led to a dedicated scouting event, during which the selected startups presented their technological solutions to FashCo’s managers and employees, after which three of them were retained as potential partners. Multiple discussions underwent such choice, for which HubCo purposefully created dedicated spaces. They, for instance, engaged in “*extra discussion moments*” (open innovation team member, HubCo) with FashCo during the selection meeting, and allocated time slots for extensive Q&A sessions with each startup after their presentations at the scouting event. They also collected FashCo’s observations after the scouting event, discussed with them about which startups would have been more suitable to do a pilot with, and moderated roundtables during the use case selection meeting, during which the first ideas for the pilots were delineated. This ongoing dialogue was

critical for FashCo to select the two startups for the pilots. As one informant recalled: “[*The use case*] probably came out of the overall discussion. I think [*HubCo*] certainly did... lead quite a lot” (entrepreneur). Having extended time to talk about their ideas and how they could benefit FashCo was also crucial for the startups and helped them get into contact with the right people within the company in an unusually rapid fashion. As one entrepreneur explained: “*it’s very rare to have that much time with many people ... [typically] before sending out the proposal you only have a one-hour meeting, which is not even with the right people, and at the end of the day you don’t really know what they were looking for, because you are not always talking to the right person.*” (entrepreneur) Similarly, some entrepreneurs recalled how during one of the events that HubCo organized:

“There was a lot of, you know, round tables, and whiteboards, and internal team discussions around how to use [our] proposition that were much more intense than I have seen with other programs.”

“We had everyone which is important in a room, and that was really cool.”

Mediating prospective resourcing. Prospective resourcing refers to “actions that turn external and internal resources into complementary combinations for future use.” (Deken et al., 2018: 1928). It entails iterative cycles of “resource exploration”, “envisioning resource use”, and “configuring resources” (Deken et al., 2018: 1921), and is particularly useful when firms seek for collaborations to generate innovative outcomes without a clearly articulated goal upfront, as it allows “managers and partners [to] collaboratively explore how combinations of resources may generate value, thereby jointly shaping strategizing as well as collaboration preferences.” (Deken et al., 2018: 1921). Our evidence, however, suggests that prospective resourcing can be very difficult when done by firms coming from very different domains of expertise, especially under conditions of task and matching ambiguity. While recent research on prospective resourcing has analyzed how it happens between the prospective collaborators themselves, in our case we observed that HubCo had a critical role in mediating this process across them, by acting as an independent third party whose role at this stage was primarily that of facilitating both FashCo and the startups figure out what they could do for one another, and how they could create mutual value. These observations

suggest that, under conditions of task and matching ambiguity, prospective resourcing may be more effective if supported by a boundary organization. As FashCo head of strategy noted:

“If [our teams] see something that they like, they are going to work with the startups directly. If they do not see something that they like but that maybe could be transformed into something completely different – because maybe the technology here is interesting – this is more difficult for them. So here having a partner that tells you ‘ok, you don’t like what you see, but from what you see here that you don’t like we could do something very interesting, and we are going to help’ this is something that they can be... they can be more forward-looking because they can have a better understanding of the technology behind.”

We observed that during both the selection and definition of the use cases, HubCo spent time with both partners to help them figure out what their expectations were, and to make sure that they both could realize what the other partner was looking for, thus clarifying which mutual gains they could achieve. As one entrepreneur recalled: “*[HubCo] really helped us understand ... how we can help [FashCo] and how we can answer their pain points. Because you know, in a relationship this is usually one of the hardest things, to understand what value you can bring to the customer.*” Similarly, our informants at HubCo described how they “*tried to give [FashCo] a framework to direct their thoughts*”, “*answered questions*”, “*collected ideas*”, “*discussed all these ideas*”, “*created a pipeline to reduce the discussion*”, “*tried to figure out what was feasible and what was not for startups*”, and “*assessed whether these startups were willing to collaborate with the company, which is not always the case.*” HubCo was also conscious of the profound knowledge differences between FashCo and the startups, and actively engaged in fostering effective communication between them. They, for instance, provided “*guidelines*” (entrepreneur) to startups on what and how to present during the scouting day, encouraged them to “*make an effort to imagine how our solution could be used by [FashCo] specifically*” (entrepreneur), and taught them how to frame presentations in a way that was “*much more focused, it’s not what you do in general, or what you did for others.*” (head of strategy, FashCo). An entrepreneur explained how HubCo “*gave us a bit of a brief, I think I explained to them in quite a detailed format how I can see us adding value to [FashCo] in different areas, and actually [HubCo] said to me you know, don’t focus on this, focus on that...*” These bits of advice were essential to engage the collaborating parties based on their shared interests (O’Mahony & Bechky, 2008). As one informant told us: “*a lot of startups that want to work with these businesses have no idea about*

how to connect with these businesses, how to pitch them in the first place – and that’s the number one challenge.”

(industry expert) They also supported FashCo to understand how the startups’ technology solutions could be adapted to achieve different results and transferred those insights to the startups to discuss with them about the economic and temporal feasibility of those ideas. Both FashCo and the startups appreciated this support, as explained by one informant: *“The overall experience has been very different with [HubCo], as there has been the whole initial phase of getting together and understanding together what could be done and what could not be done [...] certainly there has been more dialogue through HubCo, let’s say.”*

(employee, FashCo). As our evidence suggests, therefore, HubCo’s mediating endeavour was important for the prospective collaborators to overcome the boundaries of their respective knowledge domain and explore novel applications – ultimately, fostering the emergence of collaboration opportunities that were not anticipated before the start of the program. As a member of HubCo open innovation team summarized:

“What we were trying to do was, you know, opening their eyes on each startup’s potential to do different things, to deviate from what you see ... because they have a ‘corporate mentality’ – I mean, they mostly see these startups as suppliers, ‘buy/not buy’. They did not see the opportunity to collaborate, to build something together... they could only see what the startup was currently doing, what their offer was at that time. We were trying to mediate the discussion and tell them, you know, based on our experience, a startup like that can also do something different... and they were all like ‘aha, that is true, that is interesting!’”

Misaligned translation work downplays expertise boundaries and enhances awareness of complementarities

Through misaligned translation work, HubCo had a pivotal role in enabling both FashCo and the startups define how they could create value for each other and what the possible collaborative tasks might have been (i.e., the technology integration use cases), as well as to help FashCo select the best matches. Misaligned translation work was thus critical to overcome task and matching ambiguity, since, as one informant remarked, *“[FashCo] was more interested in creating new things with us than buying a product that others were using.”* (entrepreneur) As they offered their complementary knowledge to FashCo and the startups, created spaces for dialogue between them, and mediated prospective resourcing, HubCo enabled and supported the participating actors co-

create expectations and define goals for their collaboration. As one informant at HubCo explained:

“We do that together. Together, we try to understand how startups can help [FashCo].” HubCo director recalled:

“You can tell by the interaction and the way that they were watching each of these teams come up and present, you know, it was an awakening. They were like ‘this is the people that have the cool ideas ... these are the things that we need to be doing”

Our evidence suggests that through HubCo’s guidance and advice, as well as the multiple discussion tables and interactions that happened throughout the programme, both FashCo and the startups got exposed to multiple ideas about how their two domains could be combined, and had the chance to extensively reflect on how they might have leveraged on their differences to create value. By being exposed to many different ideas, FashCo was able to envision opportunities for innovation by leveraging on solutions falling beyond the scope of their business, which was useful for its employees to stimulate ideas on how they could renovate their operational processes. It was even more so for those working within business units that are not usually exposed to strategic initiatives, which usually *“know just about their stuff and the two/three things they interact with...”* and for whom *“everything else is, basically, non-existent.”* (program manager, FashCo) As our informants told, for instance: *“The very good thing is that [this program] is generating many discussions. Because either you like it, and you say ‘I take it’, or you do not like it but you say ‘ah, yes, can you do that’ and that opens other use cases.”* (program manager, FashCo) By being encouraged to reflect on why their solution could have been relevant for FashCo, in turn, startups were able to envision opportunities in a different business, test their proposition, and validate their offering, which sometimes had implications for the development of their technology solution moving forward. As one entrepreneur recalled: *“[FashCo] has very much influenced one key part of our proposition going forward [...] and this will be guiding some of our future techs builds, without doubts.”* (entrepreneur). Another explained:

“It is like you know, we can now sit down with the team, we are like ‘ok, can we get this kind of data? Can we train our module this way? Can we think about new applications of our product that we never thought about and that [FashCo] says would be very relevant? Is this something that we are going to sell to other brands? [...] If yes, it means that [FashCo] gave us ideas for our roadmap overall.” (entrepreneur)

Phase 3 (Converging and testing): The emergence of process ambiguity

The assessing and brainstorming phase terminated with two startups eventually selected as collaborators for FashCo, each one with a long list of potential applications of its technology solution to FashCo's business. During the last stage of the program, which we refer to as converging and testing, all actors involved (HubCo, FashCo, and the startups) worked together to reduce such long list to two experimental projects (use cases) for each startup, which then developed them and met FashCo after some time (between four and six months) to showcase the results. The exploration program – and our fieldwork – terminated after this final showcase meeting. The event chronology of the converging and testing phase is portrayed in Figure 1c.

-----INSERT FIGURE 1c ABOUT HERE-----

By being involved in multiple discussions and exploring potential complementarities, FashCo and the startups came up with many potential ways through which they could experiment with the startups' technology and co-create new applications together. Despite the two selected ventures were developing similar technologies (i.e., artificial intelligence to perform automated image recognition), when the converging and testing phase begun the initial brainstorming with each of them resulted in more than 50 application for one venture and 14 for the others, some of which were falling beyond the scope of a single program. These potential applications ranged from, for instance, the creation of a tool to recognize counterfeit products, a “*style advisory service*”, an internal app to go through FashCo's massive archive of past and present products (thus automating some of the tasks of its employees), to the creation of an automated tool able to predict future sales based on social media trends, among many others. While experimentation and co-creation were aligned with the exploratory nature of the initiative, the novelty of the projects they decided to develop gave rise to uncertainty about how exactly such applications should have been developed. As FashCo's program manager remarked:

“By definition it's experimentation, because we're not sure of what we are going to find.”

Our evidence suggests that, due to the novelty of these applications for both FashCo and the startups, the need for experimentation, co-creation, and quick prototyping with different solutions created a lack of clarity about “*what the pilot program would have looked like.*” (partner, HubCo) Such process ambiguity (Zuzul, 2019) – that is, “a lack of clarity about how [a project] development process should unfold” (Zuzul, 2019: 747) – is always critical, and if not resolved can lead to disagreement and ultimately failure of collaboration (Zuzul, 2019). It is even more so in the case of collaboration between incumbent firms and startups, which often work on two parallel tracks that rarely meet and can have very different interests (e.g., Katila et al., 2008). As explained by our informants:

“[Startups] can be flexible, and they can customize ... and this is the reason why we are working with [HubCo]. If you buy a product they already have in their portfolio, and that is mature, it is not a big difference. Instead, if you try to co-develop with them something new, where they have to put much effort and create something that does not exist, this is where startups can be interesting, and this is where is also important to have someone that supports the co-creation process.” (head of strategy, FashCo)

“You know, [within corporates] the executives are like: ‘this is amazing, we want to do this immediately, let’s start’. Then, three months later, they’re still talking to some manager, marketing director or innovation director or whatever, and they’re like ‘well, yeah, but we don’t know exactly where to start, we’re thinking about it, we’re still not sure’ and that’s where often the bug is now.” (director, HubCo)

Solving process ambiguity through collective orchestration work

HubCo had a critical role in managing process ambiguity (see Table 2) by actively and purposefully managing interactions between FashCo and the selected ventures in order to ensure that both parties would have delivered on their promises and could gain something from their collaboration. We refer to the type of boundary work that HubCo performed in this stage as collective orchestration work. Collective orchestration work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise purposefully and actively manage the interactions between the collaborating parties in order to i) ensure coordination; ii) support them in the execution of collaborative, experimental projects; and iii) facilitate the realization of mutual gains. We found four main mechanisms underpinning this

kind of boundary work: nurturing mutual commitment, fostering agreement, serving as negotiation forum, and dictating temporal pacing.

Nurturing mutual commitment. As one of our informants at FashCo explained: “*You need to work closely to really experiment.*” (program manager, FashCo). HubCo was conscious of the need for both FashCo and the startups to get together as much as possible during the execution stage of the program, in order to ensure that both parties were committed enough to the successful realization of the projects. HubCo director effectively explained:

“Getting the activities into the actual management of the company and getting them to be committed to making it happen is part of our biggest challenge.” (director, HubCo)

To ensure mutual commitment, HubCo arranged several meeting between all actors involved, including calls and face-to-face meetings, both before and after the development of the projects. To converge to a manageable number of use cases and give a sense to all actors as for what the process would have looked like, HubCo first organized “*two/three days of co-design with three startups*” (open innovation team member, HubCo) during which they designed “*the whole pilot, deliverables, materials, resources they might need, etcetera*” (open innovation team member, HubCo), with the aim of preparing “*a plan for the following weeks*” (field notes, 29 January 2018). They were actively involved in structuring “*an agenda of things to be done together*” (open innovation team member, HubCo) and propose “*the topics to discuss during the two days*” (open innovation team member, HubCo). They also made sure “*to stay in touch and organize the calls*” (director, HubCo) with both FashCo and the startups during the pilot execution in order to “*keep everyone updated*” (open innovation team member, HubCo), and organized a final testing meeting during which the startups could showcase the pilots results to FashCo and discuss further collaboration opportunities. During each meeting, they purposefully set up the spaces (such as the meeting rooms) in a way that facilitated communication among all the different actors involved and collaborative exploration (Lee, 2019). They, for instance, arranged chairs in a horseshoe shape and divided large groups of people in small roundtables mixing entrepreneurs with FashCo’s managers and employees across

different functions. This repeated interaction was important for the involved actors to stimulate mutual learning and sustain their reciprocal engagement. As one informant explained: “*There is value in sticking together and learning from each other, learning about how you can best implement a solution, how to best work with startups, from each other.*” (open innovation team member).

Fostering agreement. To overcome process ambiguity and avoid the risk of disagreement over the fundamental features of the projects that come with it (Zuzul, 2019), it was critical for FashCo and the startups to converge towards clearly defined objectives, be aligned as for what the critical junctures may have been, anticipate problems, and assign responsibilities accordingly. FashCo head of strategy explained:

“I can explain to you the use case itself, and that is not necessarily going to be difficult. What is going to make the solution super relevant or not, is the context around. And I can’t explain in one hour how a fashion company works. So what is difficult is to give the use case itself, and at the same time being able to provide the few critical context elements that are going to make the solution in scope or out of scope. And sometimes when we are so much into it, we do not even think about it. And then someone comes with the first solution, and we are like ‘no, this is completely stupid.’ But if I don’t tell you, by definition you don’t know.”

Another informant echoed these ideas, stating that “*if you have never worked in one of these brands, understanding how they operate is very complicated, and very difficult.*” (industry expert). HubCo engaged in a variety of activities to help the involved actors agree on the fundamental features of the projects. They moderated each discussion session during the pilot workshop to “*stimulate them to understand how the overall thing is going to be structured*”, helped “*define FashCo’s shopping list, and resources and activities needed for the startups*” (head of scouting, HubCo), ensured that the involved actors “*made explicit decisions about what the use cases were, and how they were going to move*” (partner, HubCo) and oriented conversations between FashCo and the startups on “*what is strategic for [FashCo] and what the startups feel let’s say stronger resolving, to define what is more strategically important and define what is going to be the final use case for the pilot*” (director, HubCo). They also spent time with the startups after the collective discussions to help them make sense of FashCo’s ideas and turn them into viable project plans and offered them suggestions on how to best craft such plans. As an entrepreneur described:

“I had the meetings with [FashCo], and I had feedback from [HubCo]. So they were like ‘hey here it’s better to do this, better to focus there, better to have a Gantt’, ok. So I adapted everything to what they were expecting.” Due to the experimental nature of the projects and the lack of knowledge about each other’s expertise domains, having a clear picture of what FashCo wanted, as well as how startups could realize these expectations without totally revolutionizing their products was critical for the successful execution of the pilots and the realization of mutual gains. As HubCo director stated during a meeting:

“The objective today ... is to make sure that we have everything we need to be able to say: ‘ok, this the way this pilot is going to flow’... at some point, my work will be to raise the hand and say: ‘ok, great conversation, now we need to decide.’”

“The more specific we are to define something very detailed for the pilot, the more likely the output will be something very useful.”

Serving as negotiation forum. Despite all actors’ efforts, sometimes conflict arose during the execution. When it came to preparing the contractual agreement between FashCo and the startups, for instance, they were both convinced that their standard template should have been used. Other times, FashCo realized that the startups’ technology was not able to meet some requirements. And again, other times the startups realized that even when everything seemed to be set, they were still not talking the same language. The following examples illustrate some of these conflicts:

“There’s a huge difference here with us. [FashCo] sent me a contract ... like if we were developing a new product for them. But the difference with us is that we are not developing a new product. We are using technology to provide a service for them. And that is a huge difference! So, of course, the contract I had from FashCo had nothing to do with what we were doing. This was a big mistake. So when I received it, I read it, I called [HubCo], and I said, ‘this contract is not describing what we’re doing. It is not good for FashCo, and it is not good for us either, because it’s not covering anything. We are not developing anything, so it doesn’t make sense.’” (entrepreneur)

“We have a neural network that can detect 54 different categories of clothes, but they are pre-defined categories. We have to match these categories to [FashCo] categories, and this is a hard job. Matching their categories with ours is very, very difficult. Imagine, sometimes we found categories like: ‘floral spring’. What is ‘floral spring’? We understand coats, jackets, pants, shorts, skirts, dresses. But we don’t understand ‘floral spring’.” (entrepreneur)

“[The startup] did a mistake in the sales forecast ... for instance, they didn’t take seasonality into account, they didn’t multiply December by 2 ... FashCo people got nervous, they were like: ‘ok, we can’t understand the data’” (program manager, HubCo)

Whenever a conflict arose, HubCo played an essential role as a primary forum for dialogue between the collaborating firms, aiding negotiations and serving as “*a sort of buffer between them.*” (program manager, HubCo). As some entrepreneurs stated: “*I am using HubCo for my questions*”, and similarly: “*I am like negotiating twice. I am negotiating with HubCo, and after that, I am negotiating with FashCo. It’s an indirect negotiation, sort of?*” In response to these issues, our informants recalled how HubCo actively tried “*to find an agreement with [FashCo] and the startups*” (open innovation team member, HubCo), filtered communications between the two parties, asked for any missing information, answered questions, and sometimes convinced parties to reciprocally accommodate their requests, such as in the case of legal contracts. Some entrepreneurs explained: “*I was discussing with HubCo, and HubCo was giving me the feedback – so everything was fine.*” (entrepreneur), “*I had some interactions with HubCo regarding [an issue], to let them know how we stand, how we feel about it*” (entrepreneur), and similarly: “*[HubCo] helped us also in the execution of the pilot by being behind us ... it’s always more convenient to go through [HubCo] than to FashCo directly*” (entrepreneur).

Dictating temporal pace. Despite the time and efforts both FashCo employees and the entrepreneurs were putting into the projects, none of them was dedicated to their development full time. As one informant at FashCo explained: “*all the people who are doing this are doing this at 10% of their time and in addition with running their business, and some projects require more than 10% of their time.*” To avoid progress getting too slow and having everyone left with frustration and no sense of purpose, HubCo designed the structure of the program to accommodate the parties’ different orientations toward timing and ensure the achievement of concrete results within a manageable timeframe for both of them. As an entrepreneur explained: “*sometimes getting to an agreement on a project can take from 12 to 16 months. I mean, these numbers can kill a startup ... a startup cannot deal with this timing. And then during these months, [corporates] require meetings, offers... without getting to the point. So I think that [HubCo] harness the big company in a structured process, with fixed deadlines... And perhaps, it’s easier for us to get organized.*” Others echoed: “*they followed a structured process, leading to some results in a short time*

... *that's a critical aspect in my opinion*", and likewise: *"it's better to know exactly where you stand with people and don't waste your time. So this program helped for that."* Similarly, our corporate informants explained how HubCo's mediation enabled them to *"put the right structure in motion"*, *"dictate the timing"*, and *"move faster."* HubCo director echoed: *"what [they] do after is completely open. But we really want to show [FashCo] something quickly."* (director, HubCo).

To dictate timing and activities, HubCo also actively monitored the development of the pilots during the execution stage. They, for instance, arranged deadlines and meetings in a way that would accommodate both parties' agenda. Sometimes, they put the program on hold to give all actors time to process the outputs of the previous stage or to avoid that some other urgent activities would distract them from spending enough time on the projects. They, for instance, included in the program schedule a break of several weeks after the pilot workshop to give startups enough time to prepare their action plan and scheduled activities far from important events such as fashion weeks. These activities were crucial for the successful realization of the pilots and the program more in general, and corroborate the importance of HubCo's coordinating role during the execution stage, as well as its evolving role throughout the process. As one informant recalled: *"I think it's physiological, you get just so much into operations that the only function is to dictate the time and make sure that startups will deliver what they are expected to."* (program manager, FashCo).

Collective orchestration work fuels mutual engagement and the emergence of long-term business relations

As they engaged in repeated meetings, experimented together with novel solutions, and negotiated conflicts, both FashCo and the startups had many opportunities to get acquainted and exchange ideas, and spent many hours at meetings and informal gatherings. Such unusual level of participation from many different actors created an atmosphere of excitement that fuelled each party's willingness to devote time and resources to the initiative, even though neither FashCo nor the startups were sure of what the final result would have been. As one entrepreneur clearly stated: *"honestly, they are more engaged because they are spending a lot of time with us, but also we are more engaged because*

we spent a lot of time with them.” Our informants, for instance, referred to the overall climate surrounding the initiative using adjectives such as “*positive*”, “*creative*”, “*intense*”, and “*just right*.” They repeatedly emphasized how they were positively surprised by the overall pleasant climate surrounding the initiative, which is surprising in collaborations between corporates and startups that are often depicted as generally frustrating for new ventures, which often perceive to be exploited to the exclusive advantage of incumbent firms. On the contrary, our informants commented:

“They were very happy, very excited with the idea of doing things... so, I enjoyed the mess.” (entrepreneur)

“When we create this excitement ... we let it flow in the meetings and everywhere.” (entrepreneur)

Such reciprocal engagement, in turn, was essential to sustain the collaborating actors’ commitment to the projects, reduce disagreements, and ensure the realization of mutual gains – ultimately, facilitating the execution of their experimental collaboration and enhancing their ability to work together successfully. As one entrepreneur recalled, for instance: “*I think I never had the opportunity to be so close to the customer, and to understand how to give value to the customer so far.*” (entrepreneur).

By enabling the collaborating actors to experience a sense of purpose of the whole initiative and fostering enthusiasm towards the project, such mutual engagement ultimately led FashCo and the startups to successfully conclude the experimental projects with a showcase meeting, after which they continued to manage their relationship without HubCo’s support – as explained by one informant at FashCo: “*I mean, at this point we could leave the business unit totally free to manage everything, and HubCo was no longer necessary.*” Because throughout the process they both had learned how to create and deliver mutual value, our informants described HubCo’s exit as “*physiological*.” (program manager, FashCo) Overall, our evidence suggests that by setting the stage for collaboration and providing strategic direction, creating the conditions for the involved actors to effectively communicate, and managing their interactions in a way that sustained their reciprocal engagement

despite uncertainty, the three processes of boundary work that we observed ultimately led to the successful execution of the initiative, which subsequently evolved into a long-term partnership between FashCo and HubCo, and a formal collaboration between FashCo and one of the selected startups.

DISCUSSION

Our study of the ‘Exploration programme’, a successful open innovation initiative involving a well-established company in the fashion industry, various startups developing digital technologies, and an open innovation intermediary serving as boundary organization between them, sheds light on how boundary organizations enable and assist co-creation of innovation across organizational as well as disciplinary boundaries. Table 3 provides additional evidence on the three different types of boundary work through which HubCo enabled and supported FashCo and the startups find one another and develop experimental collaborative projects.

-----INSERT TABLE 3 ABOUT HERE-----

In the next section, we present a process model that explains the evolving challenges faced by corporates and startups as they seek to collaborate across domains to create innovations, and the morphing types of boundary work that boundary organization can enact to help them overcome such challenges. We then turn to a general discussion of how the process that we unpack contributes to theory and future research on boundary organizations, collaborations between incumbent firms and startups and, more generally, inter-organizational relations.

The evolving challenges of exploratory inter-organizational collaborations across domains and the role of boundary organizations in addressing them: a process model.

Inter-organizational collaborations aimed at exploring innovation opportunities across diverse knowledge domains, such as collaborations between incumbent firms and startups from different industries, can be valuable means through which new products and services are ideated and co-created. Due to their exploratory nature and the inherent uncertainty of their outcomes, however, they also present distinctive challenges for the participating firms. As our findings

illustrate, boundary organization have a crucial role in this setting. By accompanying the collaborating parties throughout the whole process of collaboration, boundary organizations enable the emergence of such inter-organizational relations, assist the collaborating partners in their execution, and ultimately help to create longer-term business relations. They, therefore, serve as morphing mediators, whose role adapts dynamically over time, to assist the evolving needs of the collaborating parties from the inception of the collaboration to the realization of its desired outcomes. Such dynamic adaptation is underpinned by three different types of ambiguity, which occur sequentially throughout the process of initiation and execution of inter-organizational collaborations.

Ambiguity is inherent in collaborations aimed at the creation of innovations through collaboration (Carlile, 2004; Deken et al., 2018; Lingo & O'Mahony, 2010; Simonin, 1999; Zuzul, 2019). Individuals from diverse knowledge domains seeking both within and across organizations face ambiguity when, for instance, they have to interpret externally generated knowledge (Simonin, 1999), choose which potential partner would bring the most valuable resources (Deken et al., 2018), reconcile different interpretations of the same construct (Carlile, 2004; Zuzul, 2019), and enact collaborative creating projects (Lingo & O'Mahony, 2010). Our analysis of the Exploration program shows that when individuals explore unknown knowledge domains for the first time (as in many cases of collaborations between corporates and startups across different industries), the lack of domain-specific accumulated knowledge they face can lead them to experience a kind of ambiguity that we have labelled strategic ambiguity. Strategic ambiguity refers to a lack of a well-articulated strategic direction as for what the goal of the collaboration might be, which in turn leads to a multiplicity of possible paths along which such goal might be created and pursued. When organizations are unable to overcome strategic ambiguity themselves – for instance, because the external knowledge they are searching is too distant from their own – ambiguity calls for the intervention of an external mediator acting as boundary organization to effectively support strategizing and provide direction for collaboration moving forward.

In response to strategic ambiguity, boundary organizations can shape strategizing through cross-domain framing work. Cross-domain framing work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise enable the initiation of exploratory inter-organizational relations by gathering knowledge about prospective partners and combining it with their own knowledge, in order to frame expectations for prospective collaboration. The exploration program case shows that, in order to accomplish such objective, boundary organizations share reciprocal knowledge with prospective partners, frame expectations, and sharpen the scope of the search for potential partners accordingly. Sharing reciprocal knowledge is important to develop a common vocabulary – in other words, a lexicon that the collaborating parties “use as they share and assess each other’s knowledge” (Carlile, 2004: 562) – through which boundary organizations understand and interpret each partners’ overarching interests and effectively communicate with them across knowledge boundaries. Such accumulated knowledge is used to develop a shared vision about the strategic objectives to be accomplished through collaboration (framing expectation) and eventually translated into concrete criteria that can orient the search for potential partners in the desired direction (sharpening search focus).

Because cross-domain framing work is aimed at providing strategic direction through collective strategizing, it entails diffused involvement and intense interaction among multiple people, in order to collect different ideas and assign the strategic priorities that are necessary to orient collaboration. Intense interaction and exposure to knowledge and ideas coming from people in different roles, business units or organizations is critical to enhance prospective partners’ boundary permeability – that is, their receptiveness towards externally-generated knowledge (Leifer & Delbecq, 1978). The more diverse and numerous the people involved, however, the more diversified and variegated the landscape of potential knowledge integration opportunities, which in turn may lead to a lack of clarity about how exactly these opportunities can be exploited. At *FashCo*, for instance, the creation of a startups evaluation committee made of people from various business units confronted with different issues led to what we have labelled task ambiguity: a lack

of clarity about which specific output a prospective collaboration is formed to accomplish. Tasks are essential in the formation of inter-organizational relations, in that they usually serve as primary criteria according to which potential partners are assessed (e.g., Furlotti & Soda, 2018; Soda & Furlotti, 2017). If prospective tasks are not clear upfront, however, evaluating the level of match between collaboration-seeking organizations and potential collaborators becomes problematic. As we have observed, task ambiguity is thus accompanied by matching ambiguity: a lack of clarity about who the best partner may be to realize a desired collaborative output.

In response to task and matching ambiguity, boundary organizations can help collaboration-seeking organizations evaluate prospective partners and figure out with them how they could create mutual value by performing what we have called misaligned translation work. Misaligned translation work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise engage in shaping the collaborating parties' knowledge boundaries, in order to create the condition for them to communicate with each other effectively. This type of boundary work resembles what Langley et al. (2019: 26) have labelled "collaborative boundary work" – i.e. "practices through which groups, occupations and organizations work at boundaries to develop and sustain patterns of collaboration and coordination in settings where groups cannot achieve collective goals alone." When prospective partners have to co-create an innovative outcome across domains of expertise, however, they may be unable to perform collaborative boundary work themselves, as they lack the domain-specific knowledge that would enable them to communicate effectively (e.g., Carlile, 2004). While collaborative boundary work happens between the collaborating actors themselves, misaligned translation work is performed by an external mediator acting across them, and is aimed at creating the conditions for them to communicate across expertise domains. Effective communication, in turn, is critical for the successful realization of collaborative innovation (Carlile, 2004; Zuzul, 2019). As they engage in misaligned translation work, boundary organizations working across expertise domains offer complementary knowledge to help collaboration-seeking

organizations evaluate potential collaborators, create spaces for dialogue between them, and mediate prospective resourcing (Deken et al., 2018) among them to enable them envisioning how their respective resources could be combined in order to realize a mutually valuable outcome.

In the exploration program, misaligned translation work was important to downplay *FashCo's* and the startups' expertise boundaries and enhance their awareness of reciprocal complementarities. Downplaying expertise boundaries is critical for collaborating actors to reduce the distance between their respective knowledge bases (Boland & Tenkasi, 1995), negotiate common meanings (Bechky, 2003; Carlile, 2004) and facilitate the transfer of knowledge between them (Carlile, 2004; Lane & Lubatkin, 1998). As they improve their ability to communicate among each other, prospective collaborators become better equipped to explore their respective resources and envision opportunities to leverage on their differences to create value (e.g., Deken et al., 2018; Giudici et al., 2018) – which, in turn, is important to overcome task and matching ambiguity and initiate mutually satisfying collaborations.

However, exploring reciprocal resources and envisioning their use to create mutual value requires that both partners “explain and demonstrate their resources and experiment with their use.” (Deken et al., 2018: 1940), thus engaging in collaborative co-creation and experimentation. Such collaborative and interactive experimentation is even more critical when very different firms such as large incumbents and new ventures collaborate across domains – as our informants remarked: “it is very hard to tell how good a startup is before you see them in action.” (open innovation specialist, accelerator). If on the one hand collaborative experiments aimed at testing complementary resources enable the emergence of innovative ideas and their quick prototyping – which, in some cases, lead some ideas to be discarded before the actual collaboration even starts – on the other hand, they also entail ambiguous development processes. Scholars have referred to this issue as process ambiguity (e.g., Zuzul, 2019) – that is, a lack of clarity as for how the development process of the desired outcome should unfold, and how the interests of the collaborating parties might converge (or diverge) during its execution (e.g., Carlile, 2004; Lingo &

O'Mahony, 2010; Zuzul, 2019).

In the exploration program, for instance, both FashCo and the startups did not know upfront how they would have combined their expertise and resources to come up with a technology integration use case, who would have been the main stakeholders of such use case within the company, and what specific results they expected to see. On the contrary, they started with a long list of potential applications and converged to a clear case only after they engaged in repeated interaction among potential partners. To help the collaborating organizations overcome process ambiguity, boundary organizations engage in what we have called collective orchestration work. Collective orchestration work refers to a type of boundary work through which organizations working at the boundary between different domains of expertise purposefully and actively manage the interactions between the collaborating parties in order to i) ensure coordination; ii) support them in the execution of collaborative, experimental projects; and iii) facilitate the realization of mutual gains. Collective orchestration is important to ensure that both parties would deliver on their promises and realize individual as well as mutual gains. As our evidence suggests, boundary organizations can perform collective orchestration work by nurturing mutual commitment, fostering agreement, serving as negotiation forum, and dictating the temporal pace. Nurturing mutual commitment entails ensuring an adequate level of interaction among the collaborating actors, in order to sustain their engagement and attention to the experimental project. Fostering agreement enables them to align their reciprocal expectations (Miller, 2001) and clarify technical requirements and “critical design choices” (Miller, 2001: 490) that are important to preserve each party's interests (Miller, 2001; O'Mahony & Bechky, 2008) throughout collaboration. Serving as negotiation forum is critical to move potential conflicts toward resolution by facilitating discussions (Miller, 2001: 492; O'Mahony & Bechky, 2008). Finally, dictating the temporal pace is crucial to ensure the delivery of results in collaborations between organizations with very different time orientations (Das & Teng, 2000; Jones & Lichtenstein, 2008), especially when such collaborations are organized around discrete projects (Alioua & Simon, 2017; Stjerne, Söderlund, & Minbaeva,

2018).

Because collective orchestration work entails engagement of the collaborating parties in frequent meetings, rapid prototyping, and early negotiation of disagreements over operational, material, and contractual outcomes, it is also important to avoid potential frustration (e.g, Deken et al., 2018), foster a pleasant climate of curiosity and excitement towards the project results, and sustain the collaborating actors' willingness to spend time with each other and devote time and resources to the initiatives despite ambiguity over its execution and uncertainty in the final results. Figure 3 portrays the process model resulting from our analysis, which explains how boundary organizations enable and assist exploratory inter-organizational relations across expertise domains by serving as morphing mediators and managing different types of ambiguity through boundary work.

-----INSERT FIGURE 3 ABOUT HERE-----

The role of boundary organizations in inter-organizational collaborations across domains

Our findings and theorization suggest that boundary organizations have a critical role in enabling and assisting actors to engage in exploratory inter-organizational relations aimed at the creation of innovations. In order to perform this task, boundary organizations serve a dynamic and evolving role, whose plasmability goes hand-in-hand with the evolving challenges that the collaborating parties face. Our study depicts boundary organizations as *morphing mediators*, whose role changes over time as actors attempting at creating novel solutions face evolving ambiguities over the process of collaborating across domains of expertise.

Such conceptualization resonates well with the definitions of boundary organizations as intermediaries (O'Mahony & Bechky, 2008) that "form a bridge between two different sets of actors" (Guston, 1999: 90) serving as "agents of both parties involved in the collaboration at the boundary" (Guston, 1999: 105) offered by past research. However, it also provides a departure from earlier findings that have depicted boundary organizations as static, "enduring" (O'Mahony

& Bechky, 2008: 455) entities – sometimes even created by the parties themselves (O’Mahony & Bechky, 2008) – whose role is primarily that of accommodating “distinct and potentially conflicting sets of goals” (Miller, 2001: 483), negotiate conflicts and allocate mutual responsibilities (Miller, 2001), and demarcate the parties’ reciprocal boundaries to preserve “elements that are distinct to each” (O’Mahony & Bechky, 2008: 453). These findings are important to theoretically articulate the defining characteristics of boundary organizations and their role in enabling and assisting collaborations between parties belonging to different worlds (O’Mahony & Bechky, 2008), such as established corporations and new ventures. They are, however, incomplete when it comes to innovation. When conceived as a collaborative activity, the creation of innovation implies more reshaping than preserving and demarcating boundaries, for the collaborating parties to produce, negotiate, and accept those common meanings and interpretations that are essential when producing innovative outcomes through collaboration (Carlile, 2004).

Building on past research on boundary spanning (e.g., Leifer & Delbecq, 1978; Levina & Vaast, 2005; Pawlowski & Robey, 2004), boundary work (Langley et al., 2019) and collaborations across domains (e.g., Boland & Tenkasi, 1995; Carlile, 2004), our findings and interpretations offer empirical backing and a sound theoretical explanation of how boundary organizations enable such reshaping “to accommodate collaboration among organizations from incompatible social worlds or/and actors with competing interests” (Langley et al., 2019: 722) when “innovation is desired” (Carlile, 2004: 555), as well as the temporal dynamics of such boundary work. Altogether, the three processes of boundary work that we unpack – cross-domain framing work, misaligned translation work, and collective orchestration work – provide a more nuanced view of the role of boundary organizations in inter-organizational collaborations than is offered in previous research. Instead of static, enduring entities created by the collaborating parties themselves to help them negotiating grey spaces where divergent interests can be reconciled, we promote a process, temporal perspective on the role of boundary organizations in enabling and assisting collaborations between distant parties and fostering the emergence of new opportunities outside their respective

boundaries. Furthermore, by outlining the implications of the processes of boundary work performed by the boundary organization for the recognition of new business opportunities by the collaborating parties, we also corroborate recent findings that “firms’ capacity to sense new opportunities” (Giudici et al., 2018: 1396) does not always reside within the boundaries of discrete organizations, but “can be co-created through ongoing interaction” (Giudici et al., 2018: 1396) with other parties – such as network orchestrators, or, as in our case, boundary organizations.

These findings contribute to the debate on boundary work among organizations (Langley et al., 2019) that has tended to view boundaries as fixed demarcations and to study different types of boundary work in isolation, by showing how such different types of work can be recursively and synergically combined over time to help organizations face the ambiguity that is inherent in the creation of novelty and, in doing so, shape their respective boundaries to accommodate collaboration. We found that boundary organizations have a critical role in this process: through a combination of practices done in isolation as well as others performed together with the collaborating firms at different points in time, they are able to synthesize elements from both worlds and in this way help shaping the knowledge boundaries of all parties involved through purposeful boundary work (Langley et al., 2019).

Collaboration processes between incumbent firms and startups

Scholars have extensively remarked the importance for both incumbent firms and startups in matching and enacting collaboration processes (see, e.g., Alvarez & Barney, 2001; Pisano, 1990; Stuart et al., 1999), as well as the substantial challenges in making such relationships work (e.g., Mishall et al., 2010). Differently from available studies focused on issues related to asymmetric power and resource endowments, we argued that these exploratory inter-organizational relations present unique characteristics that are still poorly addressed in available research, such as the critical issue of identifying and selecting the right partner when collaboration tasks are not clarified upfront, the co-identification of innovation opportunities, and the management of relational processes between organizations whose interests are often at odds. We analyzed how, in response

to these issues, incumbent firms and startups can successfully collaborate by partnering with a boundary organization standing in-between them. In doing so, our analysis offers an alternative and fruitful path through which incumbent firms and startups can match and work together cross-organizational and domain boundaries, and lower their inherent diversity to enact collaborative innovation opportunities.

Our arguments offer empirical grounding and theoretical elaboration for how reliance on boundary organizations would minimize some common pitfalls hindering the success of collaborations between incumbent firms and new ventures – such as the choice of the correct engagement mode (Weiblen & Chesbrough, 2015), the different time orientation (Das & He, 2006), and the potential risk of misbehaviors by established firms (Alvarez & Barney, 2001; Katila et al., 2008). By enacting different types of boundary work over time to accommodate collaboration between these inherently different organizations, boundary organizations may for instance help incumbent firms develop the knowledge transfer mechanisms that past research has advocated as necessary for incumbent firms to benefit from engagement with startups (Wadhwa & Kotha, 2006). Altogether, our findings suggest that boundary organizations (such as the open innovation intermediary that we studied, or other organizational forms serving this role) are well equipped to minimize asymmetries between incumbent firms and startups (e.g., Jackson & Richter, 2017), and can enact specific processes that enable both parties to create mutual gains from their collaborations, without having to invest large amounts of time or resources in their management themselves. We hope that other researchers will find in our insights a valuable starting point to deeply investigate mutually satisfying engagement modes between incumbent firms and startups, as well as different, emergent organizational forms to serve as boundary organizations between them.

A process approach on mediated collaborations as an alternative form of inter-organizational collaborations

While the literature on inter-organizational relations (IORs) has mainly treated partner

selection and collaboration management separately as two discrete stages in partnership formation, the process view that we offer in this study helps integrate this analysis in a more comprehensive and dynamic view of such collaborations. Scholars have recently acknowledged that the existing literature on inter-organizational relations “has yet to address the inherent heterogeneity and multiplicity of these interactions” (Lumineau and Oliveira, 2018: 441). Similarly, they have referred to a “single-party blind spot” in IORs research (Lumineau and Oliveira, 2018: 444) to argue that “most of the existing research has not engaged with the coexistence of different parties in an IOR” (Lumineau and Oliveira, 2018: 445), and that there is a general tendency towards taking the point of view of a single party to drive conclusions on inter-organizational relations as a whole. Starting from these omissions, we contribute to this conversation by adding mediated collaborations to the variety of forms that inter-organizational relationships may take. Our study offers a rich empirical account of the dynamics of these triadic inter-organizational relations. By focusing on the role of boundary organizations in mitigating the challenges arising from inter-organizational collaborations across domains and enabling the identification and emergence of collaborative innovation opportunities, this study offers a window into inter-organizational collaboration processes that take into account the multiple entities involved.

Taking a closer look at the processes of boundary work that enable and support collaborations between incumbents and startups, we provide original evidence on how these organizations allow the collaborating parties to pursue mutual, and yet autonomous interests (Cropper, Ebers, Huxham, & Ring, 2008; O’Mahony & Bechky, 2008). A delicate balance underpins the role of boundary organizations in these settings and needs to be continuously monitored: though serving corporates, they always need to safeguard the interests of startups in order not to risk eroding their legitimacy and creating dissatisfaction. Boundary organizations need to be uniquely positioned to perform this tasks: to be attractive for the corporate clients, they need to have specific expertise not only in searching for potential partners and matchmaking, but also in helping them understand what they might be looking for, and in designing collaboration

processes accordingly. On the other hand, to be attractive for startups, they need to be legitimate enough to be seen as neutral and trustworthy parties by them.

Through the three processes and underlying mechanisms theorized in this study, we show that boundary organizations serve as crossover bridges that speak to both domains, and put the collaborating parties into contact in a way that leverages on their differences to ensure that they can achieve mutual gains from collaboration. In this setting, boundary organizations have to serve as blackboard on which incumbent firms can sketch out their needs, as open search engine through which potential startup partners are found according to these needs, as matchmaking device through which these potential partners are presented to the incumbent firm and opportunities are identified, and finally as coordinating vehicles that ensure a smooth collaboration process and the delivery of the expected outcome as quick and in line with the incumbent firm's expectations as possible. In doing this, they also have to constantly balance the interests of both parties, and be able to speak the language of different industries.

Boundary conditions

Although the different types of boundary work described in the previous section can be transferred from our setting to similar contexts (Lincoln & Guba, 1985) where independent organizations mediate collaborations between firms from diverse knowledge domains, our study is not free from some contextual conditions that may have facilitated the extent to which HubCo was able to perform the boundary work that we described. First, the fact that HubCo used to be an accelerator before turning to a corporate innovation hub, for instance, very likely influenced its ability to successfully stand in-between incumbent firms and startups due to its knowledge of both worlds and its legitimacy in the eye of both audiences and is perhaps a boundary condition for our study. If, on the one hand, HubCo's distinctive origin positioned it in a very unique space at the intersection of corporate and startups and thus made this empirical setting particularly germane for our main research question, on the other hand HubCo's heritage as startups accelerator enabled its members to relatively easily cross the incumbents-startups divide by, for instance, leveraging on a

well-developed network as well as a strong reputation in both worlds. Other intermediaries serving as boundary organizations between very different actors may not have the same degree of knowledge and experience on both sides. Such condition does not mean that only organizations that are or used to be startups accelerators can serve as boundary organizations between incumbent firms and new ventures, or between largely different actors more in general, nor that HubCo would not have been able to facilitate the collaboration that we studied was it not a former accelerator. It does imply, however, that to successfully perform this role these intermediaries need to know and understand the logics, language, and cultures of both parties. As our informants themselves admitted, for instance: “To truly facilitate [us and the start-ups, HubCo] needs to understand the complex specificities of our world. I'm not sure they can facilitate us otherwise.” (employee, FashCo) And similarly: “[FashCo] wanted us as a partner because we belong to this world. We know how to talk with [startups]. We know what that means.” (Program manager, HubCo) What is perhaps an important boundary condition may nonetheless serve as an avenue for future research. Even though we firmly believe that, at a higher level of abstraction, the insights from this study are transferable to other types of boundary organizations, we nonetheless think that they may provide a fertile ground for future research to devote more attention to the role of accelerators as emerging intermediaries in open innovation processes between corporates and start-ups and to develop a more nuanced understanding of this new organizational form more in general.

Second, HubCo's efforts to shape the knowledge boundaries of both parties was particularly critical in our case because the collaborating organizations greatly differed in size, age, heritage, and industry. Such efforts – and the involvement of a boundary organization more generally – may not be equally critical for collaborations between organizations of similar size or from the same industry. In our case, for instance, HubCo's involvement became gradually less critical towards the end of the process as corporate and start-ups got to know each other sufficiently well and reinforced their partner-specific absorptive capacity (Dyer and Singh, 1998). Finally, the ambiguities that we observed that made HubCo's involvement particularly critical were

driven by the fact that FashCo started with no clear goal whatsoever (i.e., they had no clear ideas as for what technology they were looking for, to solve which kind problem, in which specific area) which in turn caused lack of clarity as for which direction the search should have taken, to reach which potential partners, to develop which kind of project. This is a common case when firms embark in innovative projects and strategize along the way rather than upfront (e.g., Deken et al., 2018), but it may not always be the case.

CONCLUSIONS

Driving on a field study of an open innovation initiative involving a global company in the fashion industry, a group of digital startups, and a digital hub firm acting as boundary organization between them, we provide original evidence and theoretical elaboration on the role of boundary organizations in the formation and management of exploratory inter-organizational relations across domains of expertise. Even though we relied on a specific setting, we do not believe that the processes of boundary work and the implications described here are necessarily the exclusive preserve of the type of boundary organization that we studied. We, therefore, believe that our results would transfer to other settings, and potentially be of interest for scholars interested in boundary organizations, boundary work, inter-organizational collaborations, and open innovation more in general. Our findings offer empirical backing and a theoretical explanation of how boundary organizations enable and assist collaborations at the boundary between distant organizations when “innovation is desired” (Carlile, 2004: 555), as well as the temporal dynamics of such boundary work. Other organizations serving as intermediaries in collaborations between distant parties may use the same processes of boundary work that we theorize in the same sequence that we have depicted, or conceive them as a flexible repertoire of practices from which they can draw based on the micro and macro task that needs to be accomplished. Nonetheless, comparative replication of our study in different organizational forms serving as boundary organizations would be useful to corroborate or challenge our interpretations and push causality further than we were able to do with a single case.

In a world where collaboration across knowledge domains is ever more essential to create innovations, we believe that boundary organizations such as the one we studied will be increasingly important to help firms access external knowledge and pursue collaborative innovation. Our study represents a first step in understanding these emerging yet important and complex inter-organizational relations, as well as the role of new organizational forms acting as boundary organizations between them. We hope that further research will extend, refine, and challenge our work to shed further light on this fascinating phenomenon.

TABLES AND FIGURES

TABLE 1
Data sources and their use in the analysis.

Data source	Type of data	Use in the analysis
Primary data sources		
Observations (83 hours)	<p><i>Field notes from attendance to project meetings and program-related events (70 hours).</i> From July 2017 to June 2018, the first author spent a total of 70 hours at HubCo's and FashCo's offices, doing participant and non-participant observations, attending to collaborative activities between the boundary organization and the companies involved (she attended the most important meetings and event whenever she was allowed to participate as observer), and discussing with HubCo's program managers and scouting specialists about the program developments.</p>	Build detailed narratives of the process of collaboration and get a deep-dive into specific critical events; analyze dialogues and interactions in real-time; triangulate and supplement interpretations from interviews.
	<p><i>Field notes from attendance to other events (13 hours).</i> Before and during the Exploration programme, both authors attended some events held by HubCo as part of the activities of the open innovation unit. These events include a scouting day for an Industry 4.0 acceleration programme (on May 4, 2017), the final demo night of the same acceleration programme (on October 5, 2017), a Fashion-Tech summit (on October 17, 2017), and a workshop on blockchain technologies (on January 26, 2018), to which also some FashCo's employees participated.</p>	Familiarize ourselves with the empirical context, observe interactions between HubCo and the involved companies, and get the chance to engage in informal conversations with the events participants.
Interviews (46 interviews)	<p><i>Semi-structured formal interviews (34 interviews).</i> Interview lasted between 30 and 90 minutes, and were focused on deepening aspects related to the open innovation intermediary, the company, and the startups in general (such as its strategy, the context in which the program was initiated, its roadmap, etc.) and understanding the patterns of interactions among the involved entities. Corporate interviews were also aimed at understanding internal practices and routines related to innovation strategy, as well as deepening the outcomes of each project). Interviews with the industry expert and HubCo's competitors were primarily aimed at triangulating and refining our interpretations.</p>	Integrate, support and triangulate observational data, reconstruct informants' understanding of events

	<p>Informal interviews (12 <i>informal interviews</i>). Informal meetings with the Exploration program manager were organized approximately once a month, to discuss about program development and other program-related issues not discussed during the interviews, as well as deepening specific events throughout the development of the program. Two feedback meetings were also organized to share the preliminary results and interpretation of the analysis and get feedback from the mediator's team.</p>	<p>Clarify doubts on project-related decisions, deepen what happened during specific events or meetings during which the researcher was not allowed to be present in person, triangulate and support observations of each program phase, support emerging interpretations.</p>
<p>Other primary data sources.</p>	<p>Informal conversations. During each visit to HubCo's offices, informal conversations took place not only with the Program Manager and scouting specialists directly involved in the program, but also with other employees, HubCo's director and program managers of other programs. Notes from these conversations were subsequently integrated with observational data.</p>	<p>Familiarize with the organizational context, and gain informants' trust</p>
<p>Secondary data sources</p>		
<p>Archival data</p>	<p>Project-related documents. The first author was granted full access to the mediator program's reports, databases, artefacts such as post-its, billboards, brochures, pictures, as well as specific emails. Furthermore, the first author collected data on the startups presentations of the projects both before and after specific key events.</p>	<p>Support, integrate, and triangulate evidence from interviews and observations; deepen specific aspects of the program; triangulate our evidence with information about other projects; familiarize with the organizational contexts.</p>
	<p>Podcasts (2 <i>podcasts</i>). We also listened and transcribed two podcast (one of HubCo's program manager, one of HubCo head) that were respectively recorded for a startup summit and a digital online magazine.</p>	
	<p>Company-related documents. A number of publicly available company-related documents were collected, such as financial reports, press news covering the period of the study, and podcasts). These documents were collected for both the mediator and the established company.</p>	

TABLE 2
Illustrative evidence on the different types of ambiguity experienced by the collaborating firms in the three stages of the Exploration program

Phase 1: Setup and screening	
Ambiguity type	Selected evidence
Strategic ambiguity: Lack of a well-articulated strategic direction as for what the goal of the collaboration might be, which in turn leads to a multiplicity of possible paths along which such goal might be created and pursued	<p>“[This programme] goes in the direction of ... let's say, testing everything as quickly as possible.” (Program manager, FashCo)</p> <p>“Normally [corporates] come to us with a rather vague idea” – (Open innovation team member, HubCo)</p> <p>“Companies ... can come to us and say, 'we don't have a clear idea, we want to innovate this this and that' and that's where we come in.” – (Program manager, HubCo)</p> <p>“Most times [corporates] have really vague ideas, and it's our job to make them become concrete challenges.” (HubCo's competitor)</p>
Phase 2: Assessing and Brainstorming	
Ambiguity type	Selected evidence
Matching ambiguity: Lack of clarity about who the best partner may be to realize a desired collaborative output.	<p>“Just think about the way that these brands get into contact with startups... particularly if you work in a role that has in the title the world technology, or innovation, or anything like that, or even digital in these days, they get bombarded by startups every single day.” (partner, HubCo)</p> <p>“I think it was hard for [FashCo] to decide, because I don't know which were the parameters to choose one or the other company, but it was a hard job for them, because all the presentations were good I mean, I have seen all of them and for me they were all good presentations.” (entrepreneur)</p> <p>“Initially, [FashCo] wanted to start collaborations with many startups, with some of which it would not even make sense. I mean, they are not used to work with startups. They don't know how to do that.” (Program manager, HubCo)</p> <p>“"Finding the right startup, finding the right solution, these aren't things that corporations can do themselves, because they're not technological companies, they do retail, they're not companies that have experience in analyzing startups..." (HubCo's competitor)</p>
Task ambiguity:	<p>“I opened some many different use cases and so many ideas on how to use technology... I think that we had more than 80 different ideas.” (entrepreneur)</p>

<p>Lack of clarity about which specific output a prospective collaboration is formed to accomplish.</p>	<p>“[The selection] was very much mix of... ‘aha, this startup is really addressing an issue that we have today, good’ or ‘not necessarily addressing an issue that we have today but it looks very interesting, we would like to discover more.’” (head of strategy, FashCo)</p> <p>“I focused on giving the more information I could about on possible use cases for the technology. Not technical details, not too much, just trying to motivate people to think about that. That was the objective of the presentation, the motivation.” (entrepreneur)</p> <p>“I mean, we do indoor tracking systems. Clearly, this is something that you can apply to many different contexts, perhaps also places you didn’t think of from the beginning.” (entrepreneur)</p>
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Phase 3: Converging and testing

Ambiguity type	Selected evidence
<p>Process ambiguity: Lack of clarity as for how the development process of a desired outcome should unfold, and how the interests of the collaborating parties might converge (or diverge) during its execution</p>	<p>“I think one of the challenges of the experience was particularly around getting everybody at the same place with the same level of priority on what they wanted to achieve from the experience.” (partner, HubCo)</p> <p>“You need to know how to deal with these people, that perhaps are used to work in a different manner, with different goals... and you have to harness all this into a process and this is not straightforward, you need to know how to do that.” (entrepreneur)”</p> <p>“Fashion and innovation is a job. It’s not straightforward.” (Program manager, FashCo)</p> <p>“It’s not the corporate buys something that they know they will implement exactly the same way as it is, it’s about co-defining where is the value added in this new service and how to implement it” (HubCo’s competitor)</p>

TABLE 3
Illustrative quotes on the three types of boundary work enacted by HubCo

Type of boundary work: Cross-domain Framing Work	
Second-order dimension	Selected evidence
Sharing reciprocal knowledge	<p>“Before we started working together, there has been ... a full immersion”- (Program manager, FashCo)</p> <p>“As we got involved, there has been a sharing of experience... and then working together, there has been an alignment process.” (employee, FashCo)</p> <p>“So initially when we were talking it was like: innovation, but in what field? What sort of problems do you have in these fields? And they told us a lot of issues they had been facing. So we started from that to define where we would look for startups.” (open innovation team member, HubCo)</p> <p>“We did the brief together, four-handed.” (Program manager, HubCo)</p>
Framing expectations	<p>“We need to guide the company in defining the problem and the right solution.” (Open innovation team member, HubCo)</p> <p>“We guided them in understanding the areas they wanted to focus on.” (Open innovation team member, HubCo)</p> <p>“[HubCo] clearly spent some time understanding what [FashCo] wanted... you know, they knew exactly what kind of things the retailer wanted to see, and then they brought a sense of purpose to the whole thing, so I think that was very valuable.” (entrepreneur)</p> <p>“We frame [the scope of the programme] a lot. We spend two months framing it with [the corporate]. They come with some ideas of challenges that they want to provide, and then we work with them to make sure that the challenge is well framed, that there is a business opportunity behind it, that there are resources, etcetera. But we spend [a lot of time] helping them, providing canvas, facilitating a lot of workshops, etcetera, to make sure that these are well framed.” (HubCo’s competitor)</p>
Sharpening search focus	<p>“We gave [HubCo] a brief that was quite broad ... because we were not entirely sure about what they would do, so we said ‘ok, let’s take a broad area and let’s see what comes out’.” (Head of strategy, FashCo)</p> <p>“Initially, we always write down some potential search areas. These areas can be more or less specific, and include more or less specific problems, depending on the customer.” (open innovation team member, HubCo)</p> <p>“We always do a first skimming based on our understanding of whether they have anything to do with FashCo.”</p>

	<p>“I really think that the key in that process is being able to really filter down and select what it is, you know, what is fitting the needs of that company.” (Director, HubCo)</p>
<p>Type of boundary work: Misaligned Translation Work</p>	
<p>Second-order dimension</p>	<p>Selected evidence</p>
<p>Offering complementary knowledge</p>	<p>“[HubCo] gave us... I mean, they have a better feeling about how powerful a technology can be ... Their knowledge about startups is crucial, together with our knowledge of the business.” (Program manager, FashCo)</p> <p>“We are in a discovery phase of working with startups, so we said ‘ok, we need [HubCo’s] support’ ... and actually, I relied a lot on them.” (Head of strategy, FashCo)</p> <p>“[FashCo] doesn't know anything about startups. They can't tell if a startup is good or not, but they can tell if the startup's solution might be interesting for them.” (open innovation team member, HubCo)</p> <p>“[The value] comes from understanding startups, understanding who can execute and who can't, understanding you know, ‘are they moving in the right direction?’ , understanding what type of... ‘do they have a solid foundation?’, ‘are they the right type of fit for the company?’ And these are all the different variables that we evaluate before we come up and say ok, here’s the twenty that we think that you should meet, and then at the end of that process we can say ok, these are the two that we think you need to be partnering with.” (Director, HubCo)</p>
<p>Creating spaces for dialogue</p>	<p>“We had some very long sessions ... it’s really a chance to have three hours in a room, with everyone who is relevant for the project, telling us ‘ok, this is the pain point, this is my pain point’.” (entrepreneur)</p> <p>“We really had time to really discuss on what they need.” (entrepreneur)</p> <p>“We had two hours, we tried to ask as much as possible, to ask as many questions as possible, to understand their problems. And for us it really gave us everything we need to create a plan for them. (entrepreneur)</p> <p>When you can have people sitting at the table, having one on one discussions... I mean, that speeds up things a lot.” (employee, FashCo)</p>
<p>Mediating prospective resourcing</p>	<p>“[The use cases] came out from the exchange between who has technological competence, and who has business competence ... clearly, [having HubCo] brings added value.” (Program manager, FashCo)</p>

	<p>Talking to startups, HubCo open innovation team member says: “[FashCo] is not interested in knowing how you make money, they want to know why they should be interested in what you do. They don't want to know about your financials, how many clients you have... they want to know if your offer is interesting for them.” (fieldnotes, scouting event)</p> <p>“[We selected] largely on the basis of [HubCo]’s impressions and their feelings.” (Head of strategy, FashCo)</p> <p>“[HubCo] really helped us understand the pain points and told us what we needed to bring them to solve the pain point. So it’s really ... facilitating the interaction and let’s say, directing us to a long term relationship by helping us pinpoint their pain points.” (entrepreneur)</p>
Type of boundary work: Collective Orchestration Work	
Second-order dimension	Selected evidence
Nurturing mutual commitment	<p>"During the two days we did together ... surely, HubCo has been useful to help orienting us and the startup towards what would have been the final use case." (employee, FashCo)</p> <p>“We saw an opportunity to do a pilot with three startups and we invited them to another event with a similar format: startup presentation, then workshop with [FashCo]'s personnel to come up with ideas." (open innovation team member, HubCo)</p> <p>"We have structured an agenda of things to be done together" (Program manager, HubCo)</p> <p>"We had a third event in [HubCo], in their facilities. So there it was all about... the main ideas, what we are doing, what is the plan, what is the roadmap, what are the difficulties, what are the advantages... So it was great, I mean the day that we had, the meeting that we had in [HubCo] was very good. It was a very good format also, because it was two days." (entrepreneur)</p>
Fostering agreement	<p>Talking to everyone, HubCo director says: “The objective with these two sessions is to really make sure we have everything needed to be able to present ‘ok, this the way this pilot is gonna flow’. Ok? So all the questions... positioning, what the objectives are, who the target market is, who needs to be involved and all other questions should basically come out today... At the end of the day, we need to take decisions.” (fieldnotes, pilot design workshop)</p> <p>HubCo director asks to FashCo’s team: “Who sees ‘customer trends’ is the first priority? [FashCo team members raise hands] ok so one, two three four... five. / [HubCo director asks again]: "The next one, who sees "market trends" as a first priority? [no one raises hands]; who sees "product performance?" [four people raise hands]; and who sees "user-generated content?" [no one]. That means we have two very clear cases, you basically splitted half and half" (fieldnotes, pilot design workshop)</p> <p>"From the meeting we had at HubCo... I think what I can really remember is that we finally agreed on a very detailed plan for the pilot, and not only for the pilot but also for the longer term relationship." (entrepreneur)</p>

	<p>“When we left we were like: ok, we’re a hundred percent aligned and there is no space for misalignment or misunderstanding.” (entrepreneur)</p>
<p>Serving as negotiation forum</p>	<p>“Durign the pilot... we'll be a sort of buffer between them” (Program manager, HubCo)</p> <p>So [HubCo] is helping us like a moderator, like ‘hey, this is good, this is bad, ok, this is your red lines, this FashCo will accept and this FashCo will not accept.’ It’s very good, you know, it’s good, it’s good because you have the feedback. ” (entrepreneur)</p> <p>“We’ll have to find an agreement with [FashCo] and the startups on some issues, like intellectual property for example. We have to do this together.” (Program manager, HubCo)</p> <p>“HubCo... they helped startups formalize an output that really speaks also our language.” (Program manager, FashCO)</p>
<p>Dictating temporal pace</p>	<p>"For us [the value is in] running the project, giving time as well... It’s good to have a third party supporting the project." (head of strategy, FashCo)</p> <p>Talking to all teams, HubCo director says: “We can’t do everything, because at the end of the day we’ll will find ourselves one year from now and you still don’t know if it works and you still don’t have a solution, so our objective here is to have something that we can do in a very short period of time.” (fieldnotes, pilot design workshop)</p> <p>"We are working with big [brands] so you can imagine how this usually goes ... With a big customer it can take nine months before you have something. When [HubCo] joined the scene, I think that everything accelerated. Everything was much, much faster." (entrepreneur)</p> <p>"This is the good thing, they are organizing everything, they are doing my job." (entrepreneur)</p>

FIGURE 1A
Event chronology of the setup and screening phase

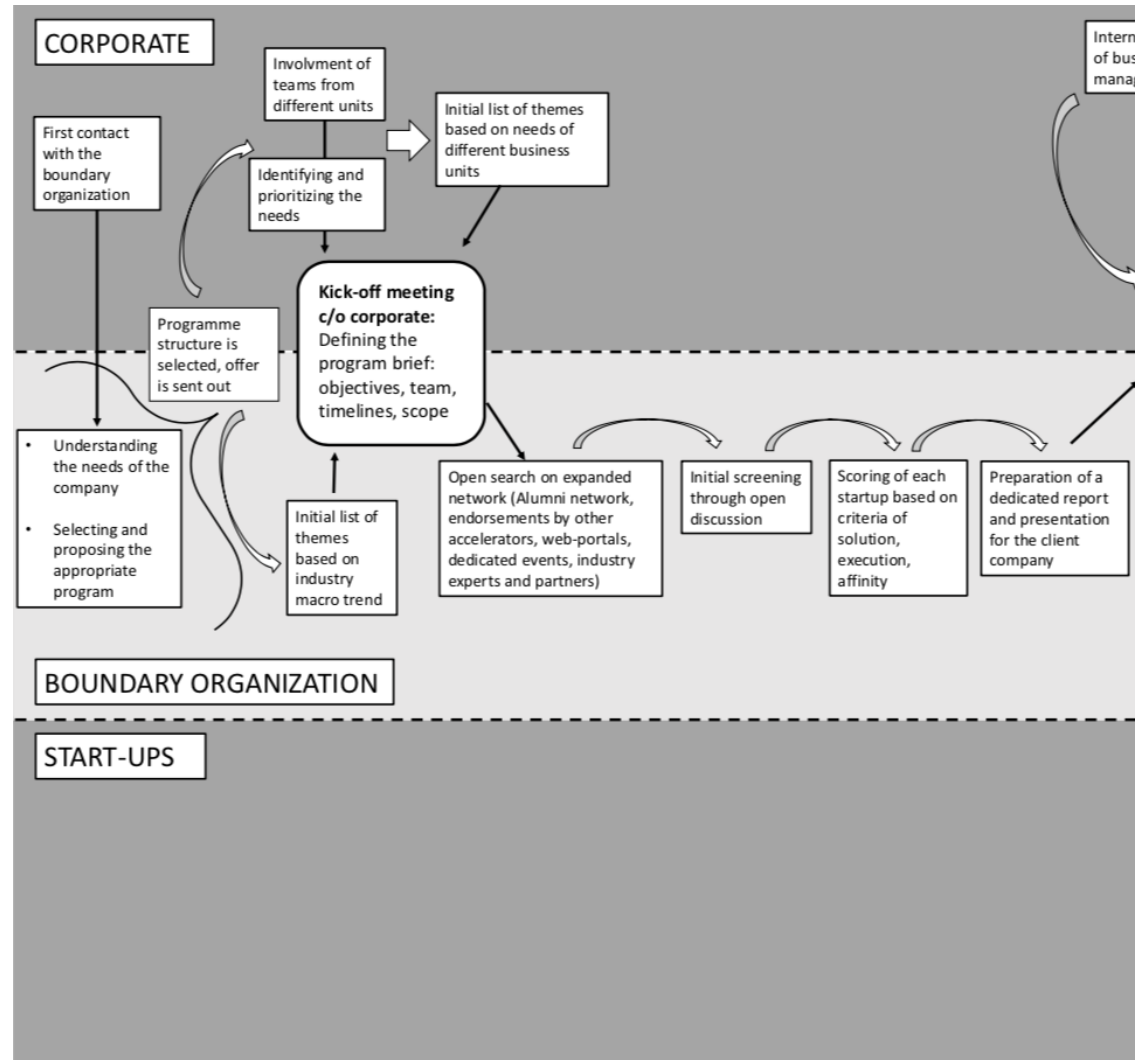


FIGURE 1B
Event chronology of the assessing and brainstorming phase

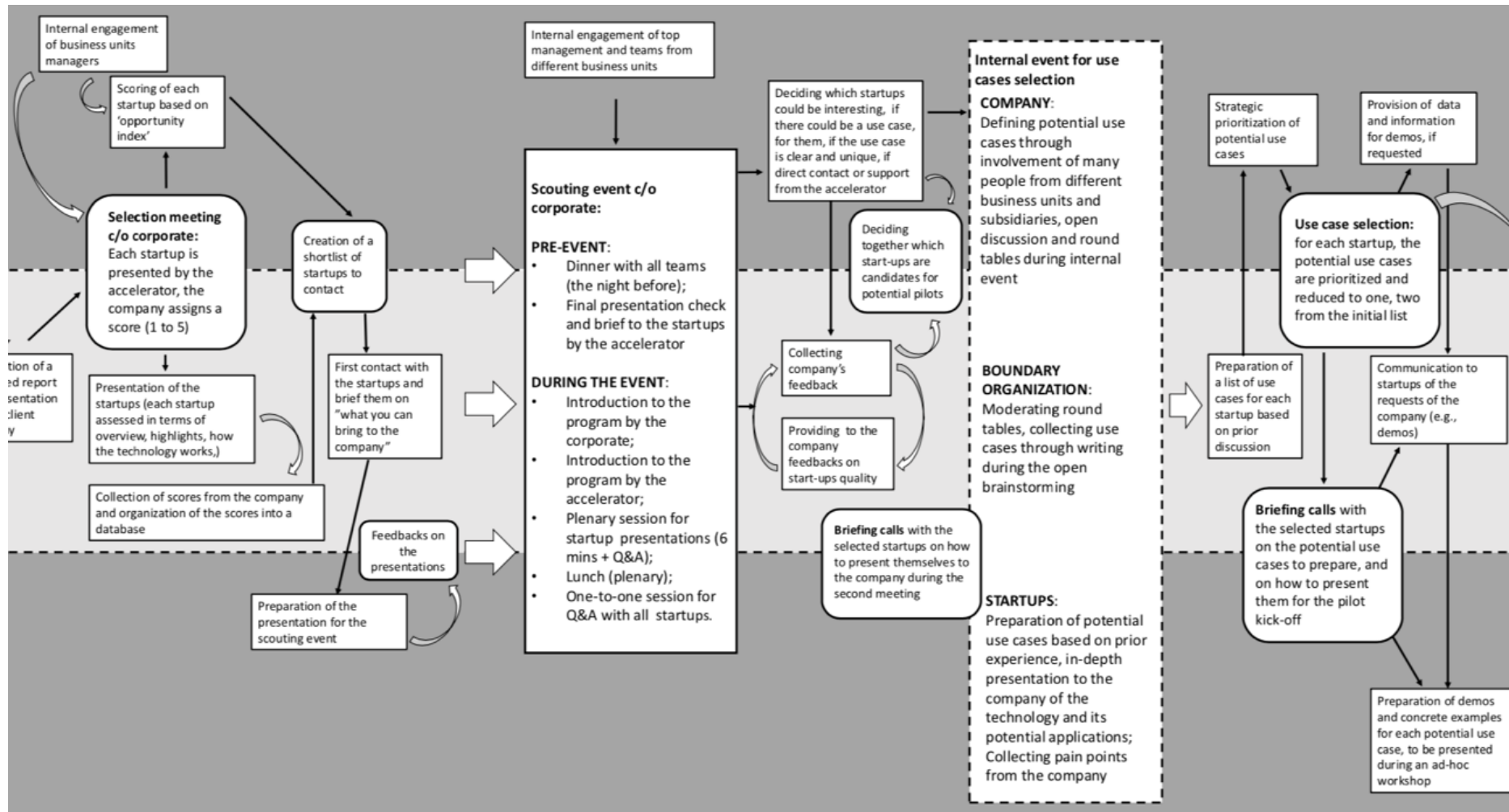


FIGURE 1C
Event chronology of the converging and testing phase

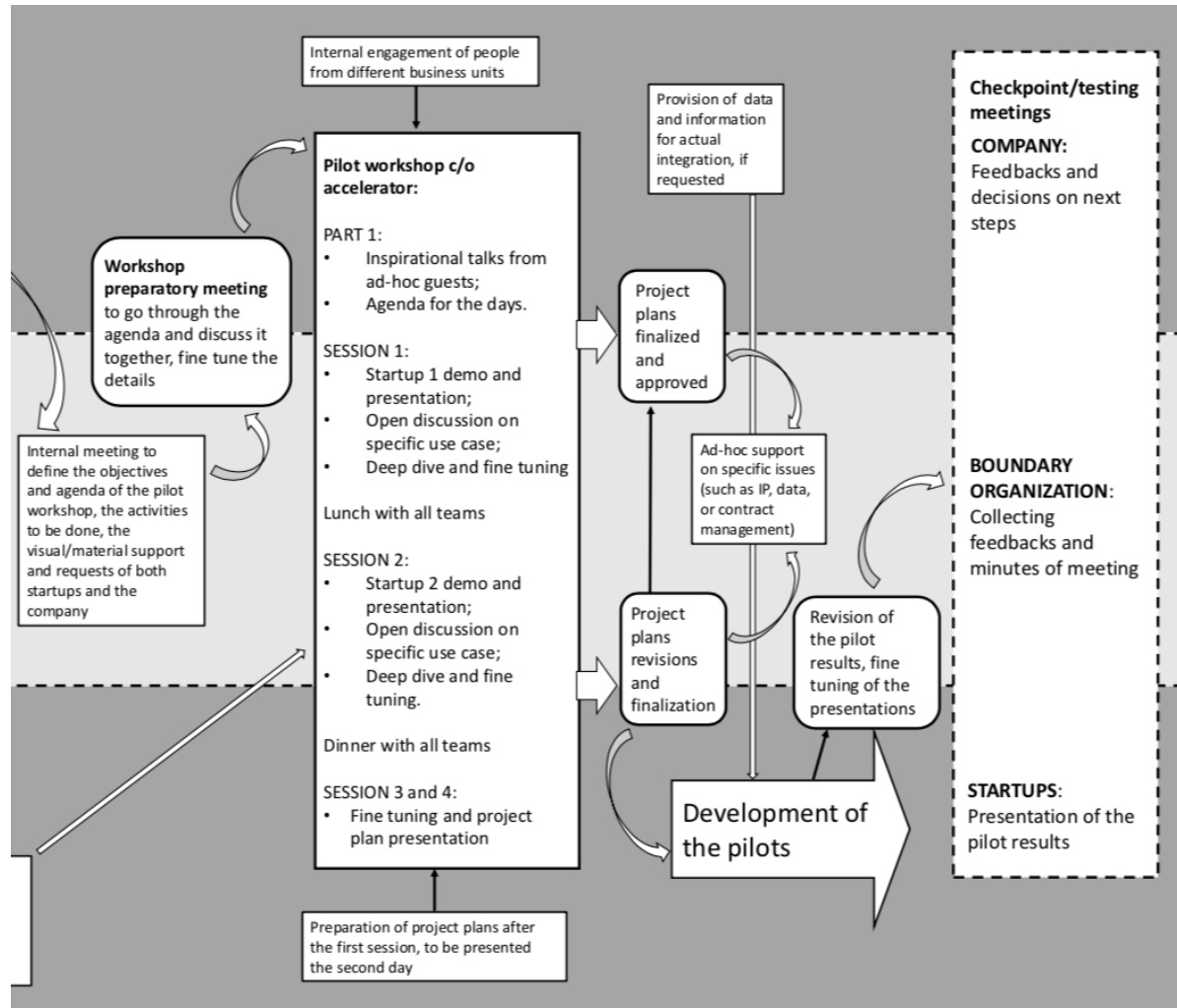


FIGURE 2A

Analysis of the relative weight of activities performed by different actors on the total number of activities at each stage of collaboration

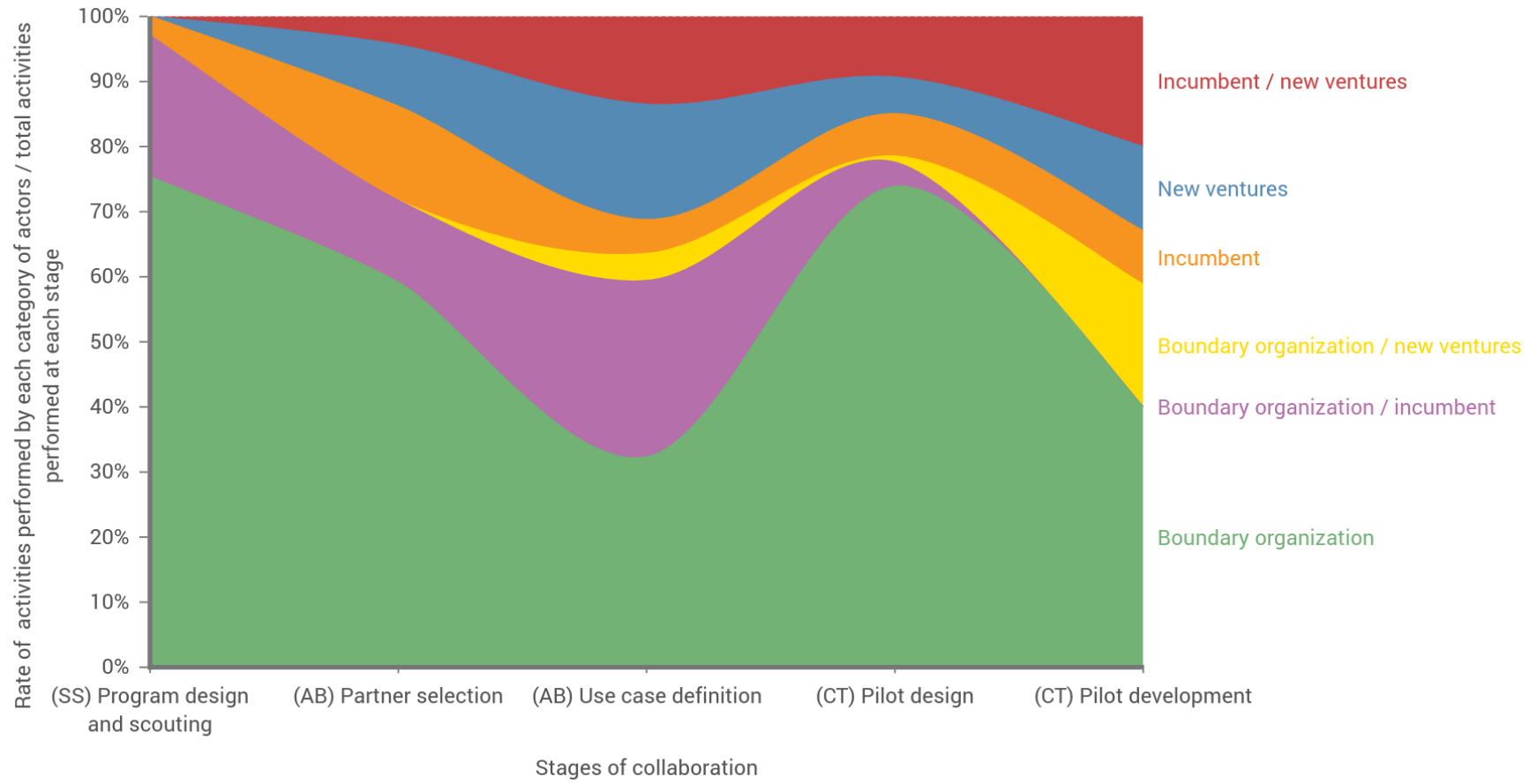


FIGURE 2B

Comparison matrix of the relative weight of activities performed by different actors on the total number of activities at each stage of collaboration (converted into a 1-4 scale)

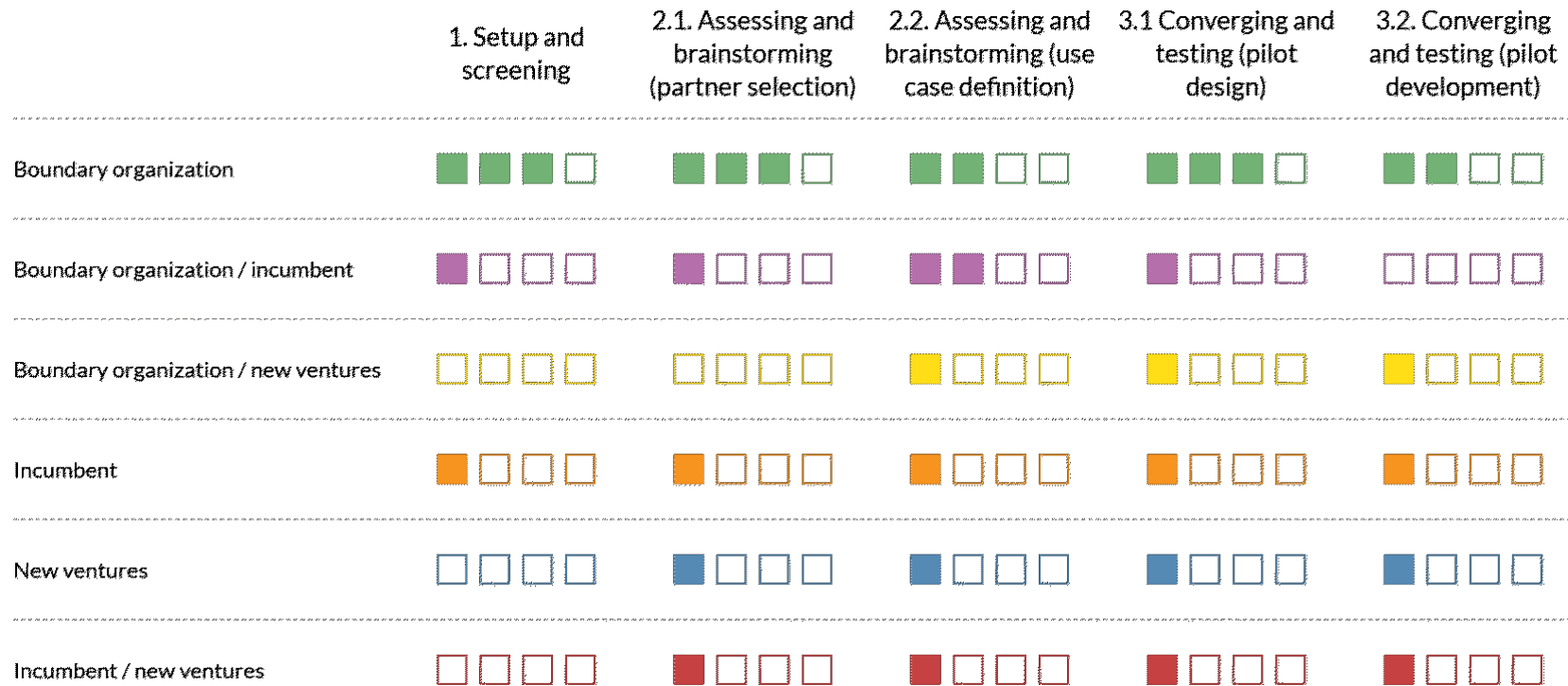
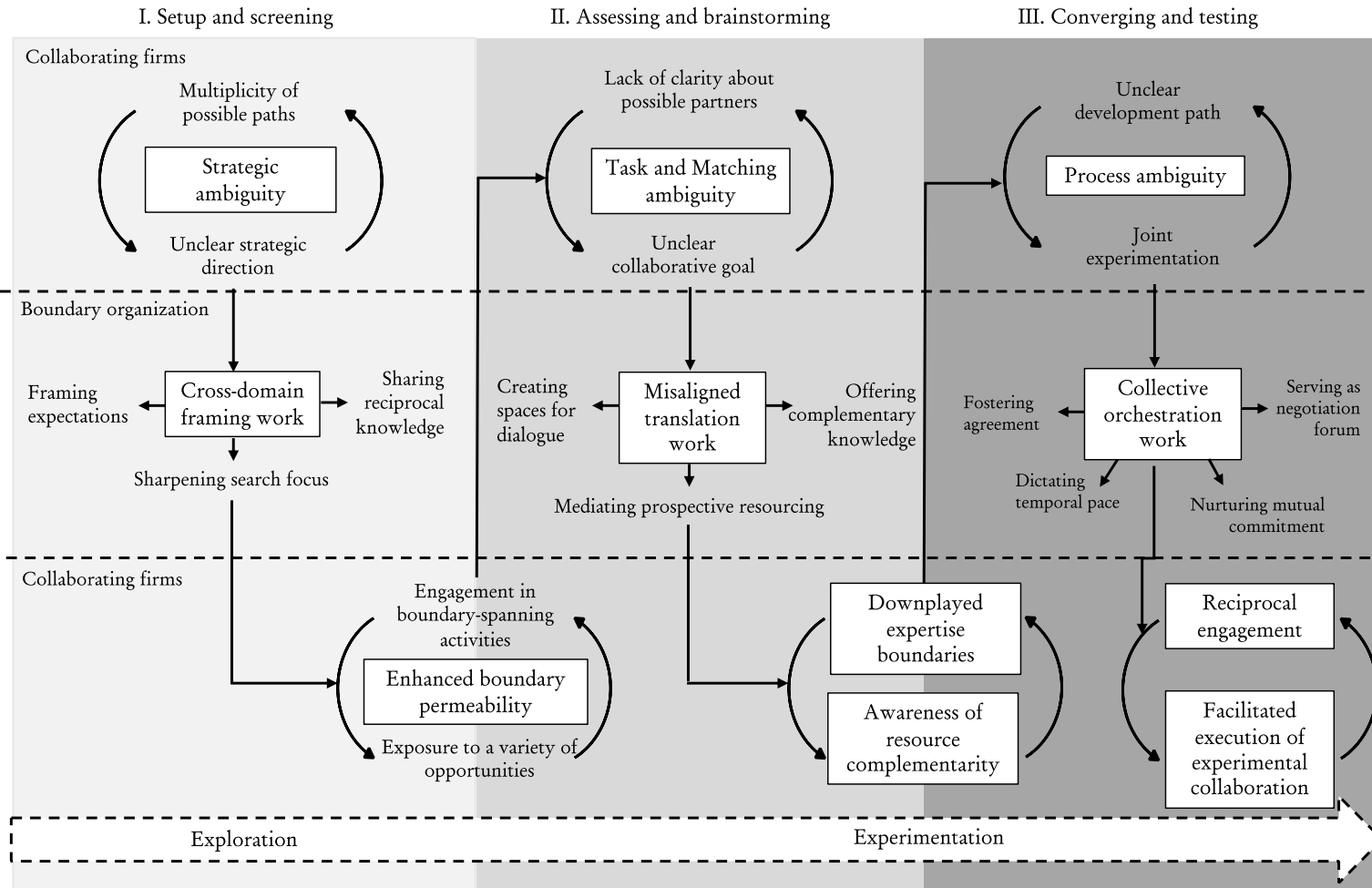
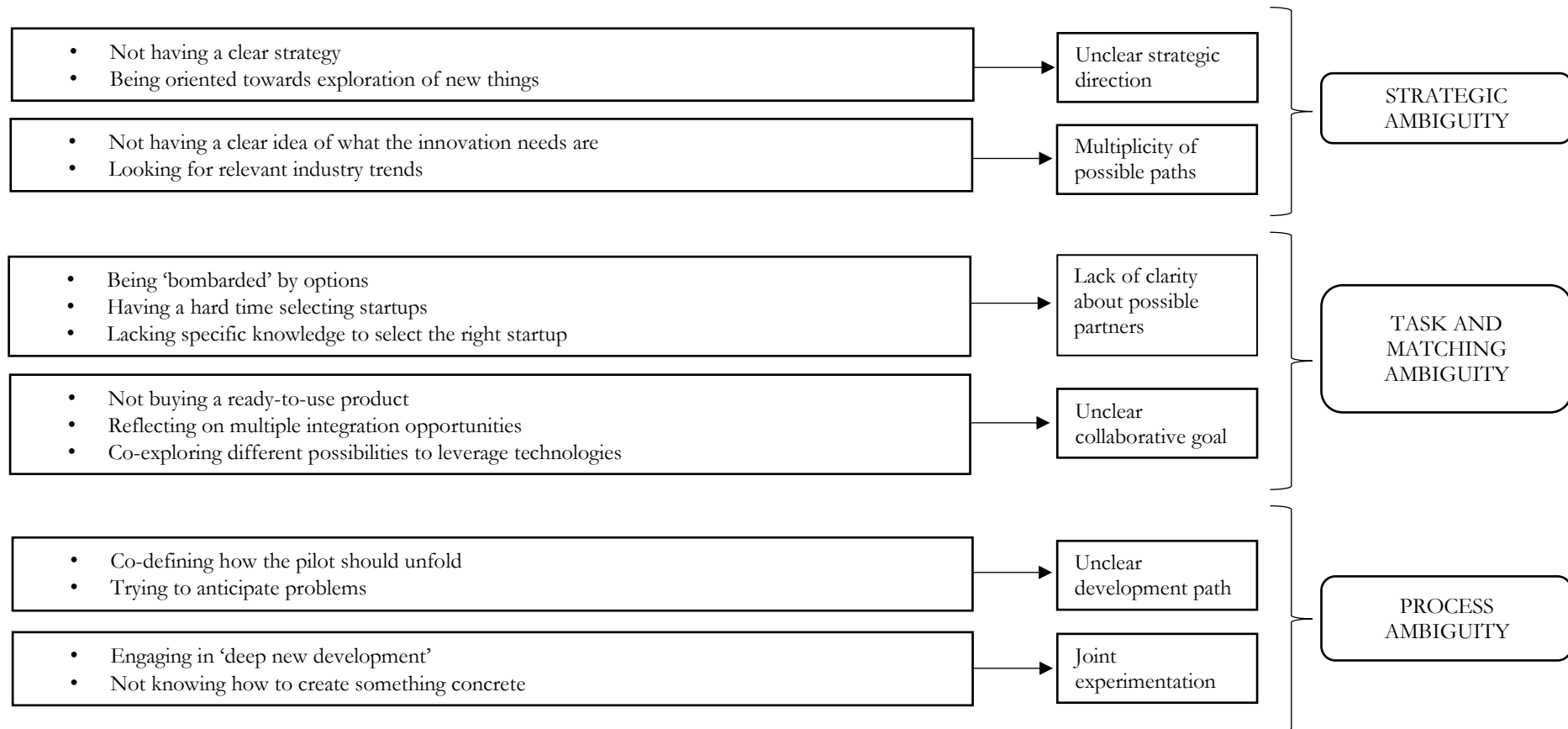


FIGURE 3
A process model of evolving challenges in exploratory inter-organizational collaborations across domains and the role of boundary organizations in addressing them through boundary work.

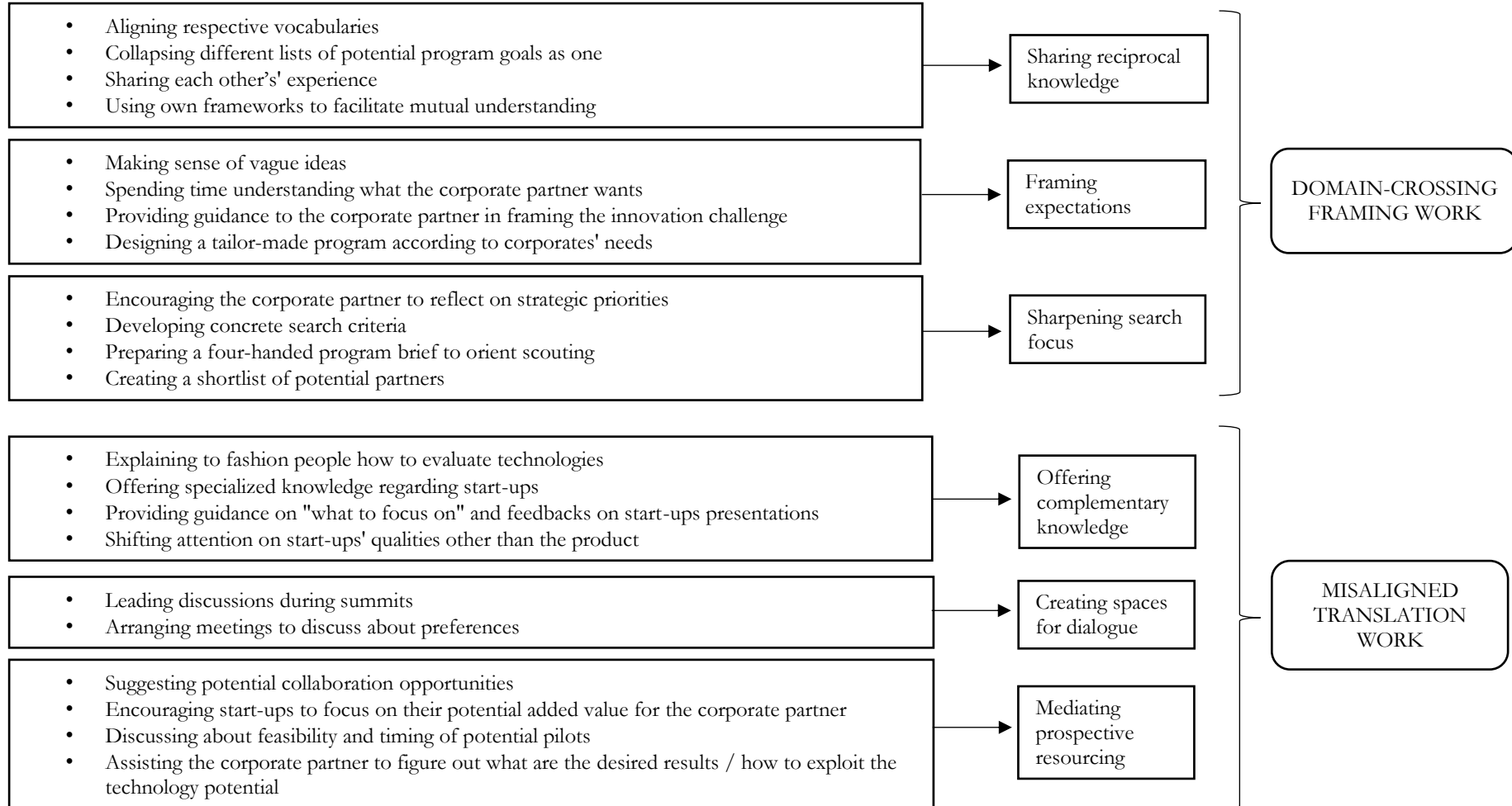


SUPPLEMENTARY MATERIALS

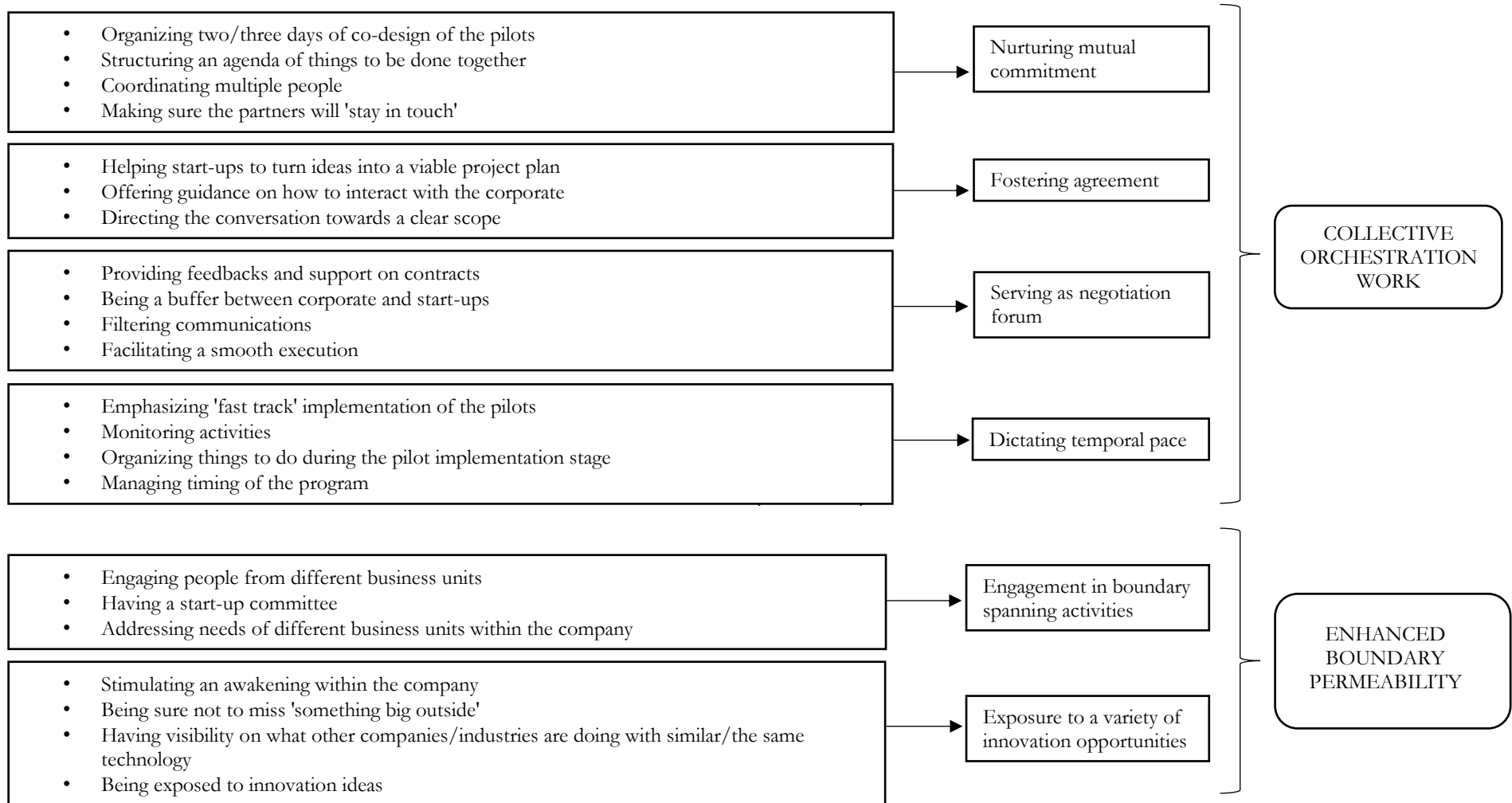
APPENDIX 1 Data Structure.



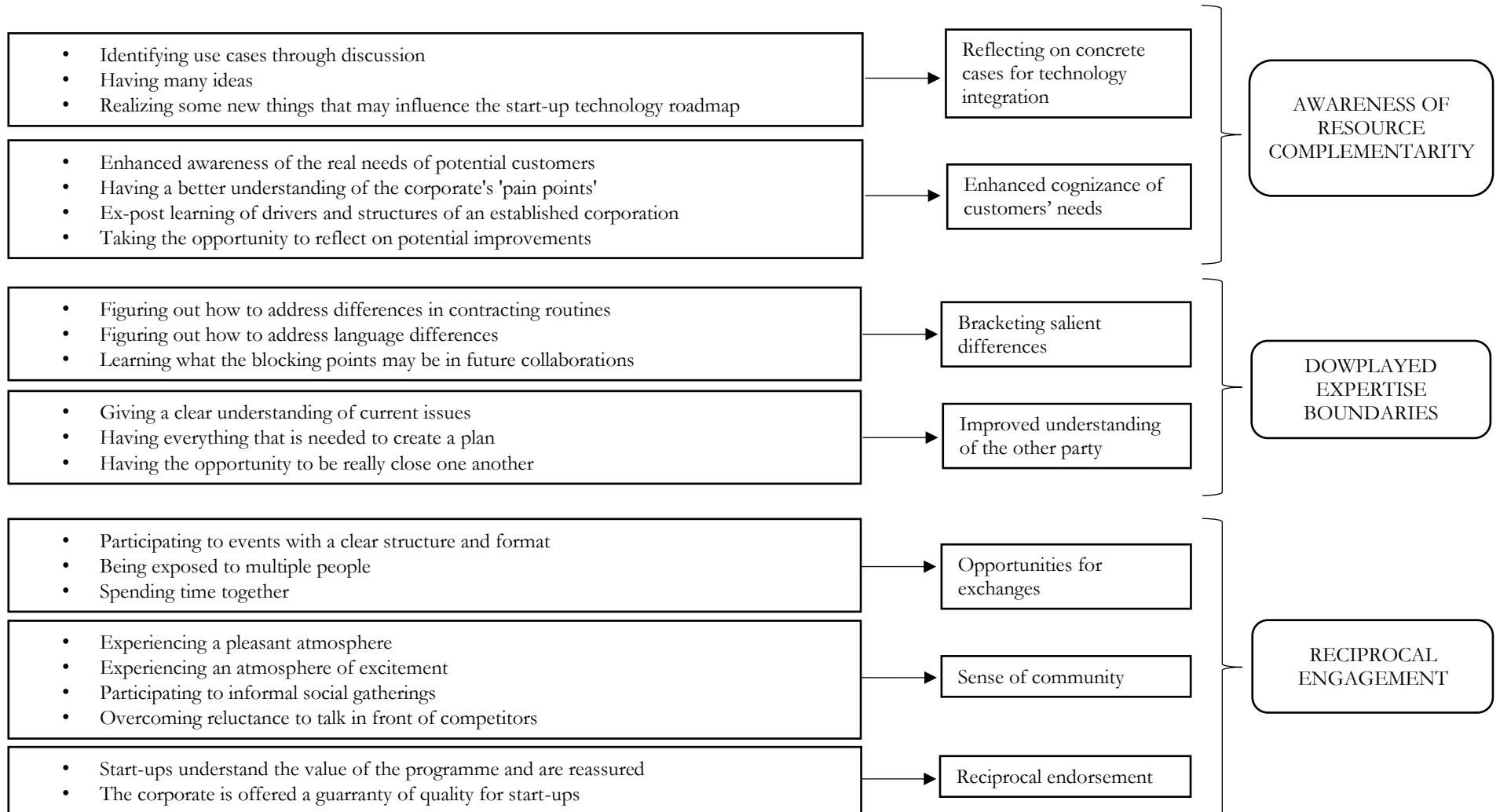
APPENDIX 1
Data Structure (continued).



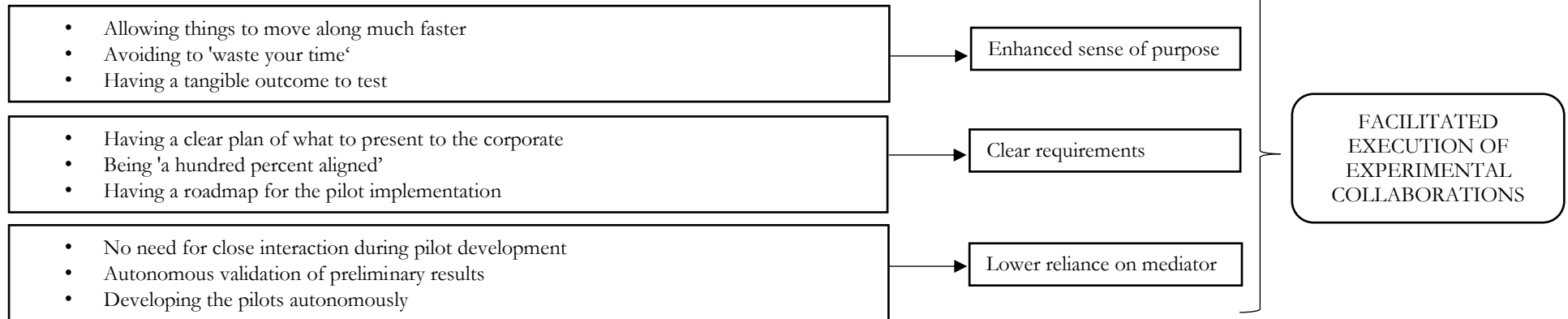
APPENDIX 1
Data Structure (continued).



APPENDIX 1
Data Structure (continued).



APPENDIX 1
Data Structure (continued).



CONCLUSIONS

The three papers in the dissertation elaborate on emerging yet increasingly important ways through which firms organize for exploration: novel business models and open innovation across knowledge domains. Being able to create and introduce successful business models that disrupt existing markets, create new ones, or enable firms to keep up with changes in their markets and maintain competitive advantages is a hallmark of strategic entrepreneurship. Innovative business models such as those introduced by firms such as Airbnb, Spotify, Uber, or Netflix are central means through which firms' exploration endeavours contribute to "the emergence of industry sectors and to changing industry conditions" (Lavie, Stettner, & Tushman, 2010: 143) by combining existing resources (e.g., homes, music, cars, and the Internet) in novel ways. But business models are also crucial for entrepreneurial organizing, in that they holistically represent "organizational structures to enact a commercial opportunity" (George & Bock, 2011: 99) encompassing its "content, structure, and governance of transactions" (Amit & Zott, 2001: 511). In Chapter 1, I systematize available studies on the ideation, design, and implementation of novel business models, offering a reframing of business model innovation from an entrepreneurial lens. This conceptualization shift attention from who introduces new business models – be it a new venture or an established organization – to what business model innovation entails, that is ideating, testing, experimenting, fine-tuning, and selecting novel and unique configurations of resources and activities in relation with the context in which such entrepreneurial actions are embedded, and based on entrepreneurial assessment of their value creation potential. This study complements research on the importance of business models for entrepreneurship focusing on the exploratory act of transforming existing business models into new ones, in order to create or respond to ever-changing competitive and demand landscapes.

Open innovation and collaboration across knowledge domains are increasingly common approaches through which firms reach distant knowledge and engage in exploration. But tangible returns from open innovation can be challenging to achieve, as it requires specific abilities to sense

and evaluate collaboration opportunities with external partners (Deken et al., 2018; Giudici et al., 2018), integrate knowledge from experts across knowledge domains (Bruns, 2012; T. W. Zuzul, 2019), and develop a congenial attitude among organizational members (Lifshitz-Assaf, 2018). In Chapter 2, we explore how these challenges can be partially overcome through collaboration with intermediaries such as accelerators, that can help firms approaching open innovation to experiment with it before committing to substantial full-scale investments. The study's findings highlight how corporations can tap on accelerators as intermediaries to experiment with corporate entrepreneurship activities, and expand available research on the role of accelerators in open innovation. In Chapter 3, we investigate how open innovation that entails collaboration across organizational from different industries can be mediated by boundary organizations, which help firms explore opportunities for co-creation across organizational as well as disciplinary boundaries. We highlight that in this context boundary organizations act as *morphing mediators*, whose role dynamically adapts following the evolving challenges that the collaborating actors face as they strategize, brainstorm, and execute experimental projects. Collectively, these three studies shed light on the processes through which firms engage in exploration to create innovation opportunities (Alvarez et al., 2012) within and across organizational boundaries, the challenges of doing so, as well as the new organizational forms that are emerging to support firms in these endeavors.

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Estratto per riassunto della tesi di dottorato

Studente: Francesca Bacco

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Dottorato: Dottorato di ricerca in Economia Aziendale - Management

Ciclo: 32°

Titolo della tesi : How Do Firms Organize for Exploration? Essays on New Business Models and Collaboration Across Domains

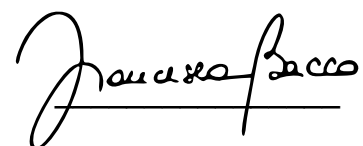
Abstract:

The three papers in the dissertation elaborate on two emerging yet important ways through which firms organize for exploration: novel business models and collaborations across knowledge domains. The first study is a literature review of research at the intersection between entrepreneurship and business model innovation. It maps the most relevant research topics and identifies several fruitful avenues for future research. In the second paper, I address the recent business model evolution of accelerators turning into corporate innovation hubs, and develop a typology of four different ways through which incumbents can collaborate with accelerators to foster corporate entrepreneurship and innovation. In the third paper, I analyze the role of boundary organizations in corporate-startup collaborations across knowledge domains, focusing on the ambiguities that these collaborations entail as well as the distinctive types of boundary work that these intermediaries enact to solve them.

Estratto:

I tre articoli che compongono questo elaborato trattano due importanti modalità attraverso cui le imprese affrontano la necessità di innovare: l'ideazione di nuovi modelli di business e le collaborazioni inter-organizzative. Il primo articolo è una revisione della letteratura che guarda all'innovazione dei modelli di business da una prospettiva imprenditoriale. Lo studio offre una mappatura dei temi e delle domande di ricerca al centro di questo dibattito, e propone diverse linee di ricerca per il futuro. Il secondo studio sviluppa una tipologia delle diverse modalità attraverso cui le imprese consolidate possono collaborare con gli acceleratori per attivare strategie imprenditoriali. Il terzo studio esplora come le 'organizzazioni di confine' che svolgono il ruolo di intermediari dell'innovazione tra imprese strutturate e startup ne facilitano la collaborazione adattando il proprio ruolo nel tempo e al variare delle complessità inerenti nei processi di creazione dell'innovazione.

Firma dello studente



Handwritten signature of Francesca Bacco, written in black ink on a white background. The signature is cursive and includes a horizontal line underneath the name.