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Completed Research Paper

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Abstract

To avoid conflicts with the core business and the existing organizational identity, incumbents increasingly externalize their digital innovation activities by handing them over to separate innovation units. While IS research provides knowledge on how internally driven innovations are initiated and developed in such units, we do not yet understand how they capitalize on internal resources, combine them with external ones, and pursue competitive actions with digital technologies. To address this issue, we apply a digital options thinking lens to investigate how corporate venture builders (CVBs) generate digital options for incumbent firms, i.e., opportunities to invest in digital innovations. Based on a case study with six CVBs, we find that such units bundle incumbents' resources and digital innovation trends (novel technologies and digital business models) into digital options through four roles. Furthermore, we demonstrate the importance of adding a detailed preparation process to the digital options framework.

Keywords: Digital Options Thinking, Corporate Venture Building, Digital Innovation.

1 Introduction

Incumbents – established firms that belong to traditional industries and are predominately born in the pre-digital age (Keller et al. 2022) – face various challenges when embracing digital innovation (Oberländer et al. 2021). Competing concerns with existing identities (Wessel et al. 2021), capabilities (Svahn et al. 2017), and practices (Smith and Beretta 2021) impede the integration of digital technologies and the pursuit of digital innovation (Svahn and Kristensson 2022). To avoid these concerns while pursuing digital innovation, incumbents often externalize their digital innovation activities to separate innovation units (Deist et al. 2023). The IS literature provides various theories to investigate such units, ranging from ambidexterity (Holotiuk and Beimborn 2019) to knowledge recombination (Hund et al. 2021). These approaches effectively explain how to initiate and develop internally driven digital innovations. However, they provide little guidance to understand how such units can *capitalize* on internal resources, combine them with external ones, and pursue competitive actions with digital technologies (Fridgen et al. 2022). Or, as Oberländer et al. put it: "the interplay between incumbents' resources and digital opportunities is hardly understood" (2021, p. 1).

This circumstance is not surprising, as digital technologies change the nature of innovation projects from being risky to uncertain. “For risk, the probabilities of an outcome are quantifiable, while for uncertainty is not” (Gustavsson and Ljungberg 2018, p. 3). Due to their layered modular architecture, digital technologies are constantly in flux and, therefore, remain incomplete (Svahn and Kristensson 2022). Furthermore, the innovation agency is no longer predefined and controlled by the incumbent but distributed among various heterogeneous actors (Nambisan et al. 2017). As a result, incumbents must constantly renew their innovation processes, as they cannot assess the outcomes of digital innovation projects in advance (Svahn and Kristensson 2022).

Digital options thinking is a powerful approach for navigating the inherent uncertainties associated with digital innovation (Kulatilaka and Venkatraman 2001; Sambamurthy et al. 2003). It comprises a mental model for innovation managers to identify, make available, and selectively realize available options into novel products and services, based on existing capabilities, potential future opportunities in the environment, and the associated uncertainties (Svahn and Kristensson 2022). In this context, a digital option refers to an opportunity to invest in new digital technologies (Sandberg et al. 2014), platform features (Rolland et al. 2018), business models (Svahn and Kristensson 2022), or ventures (Vanhaverbeke et al. 2008). They provide an incumbent with future decision rights (Amram and Kulatilaka 1999), thereby making it more agile (Sambamurthy et al. 2003) and strategically flexible (Vanhaverbeke et al. 2008).

While current IS research is already providing initial insights into the nature of digital options for incumbent firms (Oberländer et al. 2021), it is relatively silent regarding the generation of those. To overcome this issue, we apply digital options thinking to investigate a novel type of innovation unit that gained prominence in the last few years (Malev 2021), i.e., corporate venture builders (CVBs). A CVB is an independent innovation unit (i.e., stand-alone organization) mandated to generate strategically relevant digital options for the incumbent (cf. Back et al. 2019; Mittermeier et al. 2022). While corporate venturing units per se are not a new phenomenon (Narayanan et al. 2009), CVBs are unique for three reasons: First, CVBs are autonomous entities and are not fully controlled by the incumbent. Second, while traditional corporate venturing units are responsible for *investing* in externally located opportunities (e.g., a promising start-up) (Hill and Birkinshaw 2014), CVBs are tasked to *generate* opportunities for investments. Thus, they operate at the intersection of corporate venturing and firms’ strategy (Weiss et al. 2023) by leveraging and recombining incumbents’ internal and external resources to test and transform many new ideas quickly and agilely into new digital options (Back et al. 2019). Finally, CVBs usually consist of serial entrepreneurs (Schmidt et al. 2019) who are experts in building new digital businesses (Tkalich et al. 2021). Thus, they likely own the necessary entrepreneurial competencies to create digital options (Sambamurthy et al. 2003). Consequently, we ask:

How do corporate venture builders generate digital options for incumbent firms?

To answer the research question, we conducted a multiple case study with 6 CVBs (18 interviews) (Yin 2018). We used digital options thinking (Svahn and Kristensson 2022) as our theoretical lens for data analysis. Section 2 provides an overview of the current literature on digital options and corporate venture building. In section 3, we explain how we analyzed the qualitative data using the methodologies of Yin (2018) and Myers (2019). Finally, we present and discuss our findings in sections 4 and 5.

2 Theoretical Background

2.1 Options thinking for digital innovation

Options thinking originates from the finance literature, where an option constitutes a possibility to pursue an investment opportunity in the future that bears certain advantages (Fridgen et al. 2022). Management science adopted this concept to outline an organization’s ability to execute selected future actions through incremental resource investments (Bowman and Hurry 1993). Thus, in contrast to *financial* options, which are contract-based investments to ensure payoffs assigned to the holder, *real* options involve the potential investment or divestment in non-financial, real assets or intangibles, requiring identification, assessment, and capabilities for execution (Kulatilaka and Venkatraman 2001). Real options are “sequential, irreversible investments made under conditions of uncertainty” (Vanhaverbeke et al. 2008, p. 252). They generate future decision rights in terms of investments without the obligation to realize them. Thus, they are perceived as a strategic tool to address uncertainty in innovation projects (Svahn et al. 2015). In this context, options thinking can help managers as a mental model to develop strategies by making investment decisions based on existing capabilities, potential future opportunities in the environment, and the associated uncertainties (Bowman and Hurry 1993; Rolland et al. 2018).

Over the years, options thinking also found its way into IS. Sambamurthy et al. (2003) proposed that an incumbent’s investments in IT, combined with shifts in its technological environment, present digital options for competitive actions. As such, *digital options thinking* can support managers when elaborating on IT capability investments (Sandberg et al. 2014). For instance, Rolland et al. (2018) applied the theory to understand how incumbents manage digital platforms by strategizing about the investment or divestment (i.e., removing digital debt) in new technical features. Other scholars applied this theory to understand the evolution of IT systems (Drechsler et al. 2022) and the adoption of new emerging digital technologies such as AI in organizations (Fridgen et al. 2022). Hence, there is a clear focus on IT capability investments and their effects on business process performance (Sandberg et al. 2014).

However, digital options thinking can also be valuable when considering potential investments in digital innovation. In this context, Svahn and Kristensson define it as an iterative approach “in which available options for digital innovation are identified, made actionable, and selectively realized” (2022, p. 1). Applying the notion of finance and management literature to digital innovation, digital options can then be referred to as opportunities to invest in new digital business models that will extend or renew the incumbent’s value proposition in the future. Furthermore, drawing on the lifecycle concept from Sandberg et al. (2014), innovation managers can use digital options thinking as a process to [1] identify, [2] develop, and [3] realize digital options (Rolland et al. 2018). During this process, the nature of a digital option transforms from being (1) available to (2) actionable to (3) realized (Sandberg et al. 2014). In a digital innovation context, available options comprise existing investment opportunities that stem from the combination of existing resources and digital technologies’ potential and await recognition (i.e., identification). They must be evaluated and developed regarding their desirability and feasibility to make them actionable (i.e., development). The realization corresponds to a more significant investment in an actionable option (Rolland et al. 2018). Such an investment includes efforts to implement digital options regardless of whether it is a new digital product, a business unit, or a new digital start-up. Table 1 summarizes the framing of options, their lifecycle, and options thinking in the context of digital innovation.

<table>
<tr><th>Digital options</th><th>Digital options lifecycle</th><th>Digital options thinking</th></tr>
<tr><td rowspan="3">Definition: An opportunity to invest in new digital business models that will extend or renew the incumbent’s value proposition (Svahn et al. 2015; Svahn and Kristensson 2022)
Examples:
- A retailer investing in the launch of an e-commerce platform (extension)
- A manufacturer of hardware investing in the digitalization of its products to also provide data-driven analytics services (renewal)</td><td>(1) Available digital option: A digital innovation investment opportunity that stems from the incumbent’s current resources, digital technology opportunities, and their inherent uncertainty (Rolland et al. 2018)</td><td>[1] Identify: Recognize unique incumbent resources and digital technology potentials for managerial consideration</td></tr>
<tr><td>(2) Actionable digital option: A digital innovation investment that has been validated against its desirability and feasibility (Svahn et al. 2015)</td><td>[2] Develop: Evaluate and bundle unique incumbent resources and digital innovation trends into competitive actions</td></tr>
<tr><td>(2) Realized digital option: A digital innovation investment that has been made (Sandberg et al. 2014)</td><td>[3] Realize: Selectively implement the competitive actions through integration (business unit or corporate start-up) or externalization (spin-off an independent start-up)</td></tr>
</table>

Table 1. Options, options lifecycle, and options thinking in the context of digital innovation.

As mentioned above, digital options thinking has been applied primarily to investigate IT capability investments (Sandberg et al. 2014). First research that has used this approach in the context of digital innovation reports that incumbents often struggle to implement it (Svahn and Kristensson 2022). Successful digital options generation requires entrepreneurial action, i.e., exploiting market opportunities through alertness and responsiveness (Sambamurthy et al. 2003). Alertness "involves a proactive stance based on a number of cognitive capacities and processes such as prior knowledge and experiences, pattern recognition, information processing skills, and social interactions" (Tang et al. 2012, p. 79). Such capacities are often outside corporate structures (Prügl and Spitzley 2021), making investigating digital options thinking in the context of independent innovation units sensible. Since CVBs usually consist of serial entrepreneurs (Schmidt et al. 2019) and are experts in building new digital businesses (Tkalich et al. 2021), we perceive this phenomenon as suitable for our investigation.

2.2 Conceptualizing corporate venture building

Venture builders are organizations specialized in building up digital ventures in a factory-like manner (Baumann et al. 2018; Tkalich et al. 2021). They are run as corporate subsidiaries or independent, standalone organizations (Thng 2019). García-Luengo (2017) distinguishes between three sub-types. First, *independent venture builders* that work for investors (venture builder holds equity in ventures and charges service fees), such as Rocket Internet, Betaworks, or Fast Track Asia; second, *corporate-backed venture builders* that work for a single incumbent (the incumbent owns the highest stake, no service fees), such as WATTx or Bosch's Start-Up GmbH (Kullik et al. 2018); third, *independent CVBs* that work for multiple incumbents (venture builder sells its venture-building-as-a-service to incumbents), such as BCG Digital Ventures or Mach49 (García-Luengo 2017). This paper focuses on the third type, i.e., independent CVBs.

Corporate venture building has its roots in entrepreneurship (Schmidt et al. 2019; Thng 2019). Since breakthroughs often come with new young ventures, incumbents increasingly rely on entrepreneurial strategies and incubation mechanisms to stay innovative and competitive in volatile digital environments (Prügl and Spitzley 2021). Thus, incubators (Hjalmarsson Jordanius et al. 2019), accelerators (Hornberger et al. 2022), and venture builders (Mittermeier et al. 2022) were introduced in the IS literature to link the entrepreneurial and the corporate worlds in the context of digital innovation (Kullik et al. 2018). They differ in the intervention time and the support services. While incubators and accelerators support a digital start-up only in a specific phase of the entrepreneurial journey (i.e., in the stand-up and scale-up stage, respectively), venture builders cover the whole process from finding a problem to scaling a market-ready solution (Mittermeier et al. 2022). Therefore, they specialize in building digital business models and respective start-ups from scratch (Tkalich et al. 2021). Ventures created by such entities outperform traditional start-ups not only in terms of speed to funding (26 months compared to 56 months to get to Series A) but also in the success rate (30% higher chance of reaching Series A) (Zasowski 2020). Due to these successes, the model is gaining traction in incumbents' digital innovation initiatives (Fernandez-Vidal et al. 2022). For instance, prominent firms such as ING, Bosch, and Vodafone adopted the model and have already built or acquired CVBs with first presentable successes (Müller 2020).

Given the lack of digital innovation capabilities (Keller et al. 2022) and the managerial challenges that still exist when making investment decisions in digital opportunities (Xu et al. 2018), CVBs can support incumbents in pursuing digital innovation in the form of new digital ventures and business models through the generation of digital options.

3 Method

Our primary interest is to understand *how* CVBs generate digital options for incumbent firms. A qualitative case study approach seems appropriate since we investigate the under-researched concept of corporate venture building in its real-life context by asking how CVBs operate (Yin 2018).

If a research endeavor aims to illuminate and extend relationships between constructs or to develop a deeper understanding of processes, theoretical sampling is recommended (Eisenhardt and Graebner 2007). Therefore, we only contacted CVBs that (1) are independent entities, (2) work primarily with established companies, and (3) have already launched at least one digital venture. In this way, we ensured that we only included independent CVBs that had gone through all digital options lifecycle process stages in collaboration with an incumbent at least once. This is also in line with the observation that incumbents initially collaborate with independent CVBs before investing in developing their own CVB (Zasowski 2020). We also employed theoretical sampling regarding the interviewees by including only those informants that are particularly relevant in gathering in-depth insights into the process of digital options generation, i.e., management and operational staff of the CVBs and corporate entrepreneurs, founders, or leading personnel of the venture. In doing so, we aimed to provide a holistic picture of the process within the CVBs and the digital options they create for incumbents. We followed Myers (2019) recommendations for data collection, gathering data primarily through semi-structured interviews. We triangulated the interviews with secondary data received from the CVBs or obtained via publicly available information (i.e., white papers, websites, and workflow presentations). This data helped us, for instance, to go through several case studies of the CVBs and outline exemplary ones in this paper (see Table 2). In cases where the desired interviewee was not accessible to us, we used available public interviews published on Spotify (marked with '*'). We included 18 interviews, each lasting between 30 and 110 minutes, and three public interviews.

Case	Focus & exemplary case	ID	Interviewee role
A	Co-creating digital businesses in collaboration with incumbents from various industries. *Exemplary case: Design of an IIoT platform with edge device connectivity and cloud functionality as the basis for an equipment-as-a-service solution for a gear manufacturer.*	I01	Venture Principal
		I02	Venture Architect
B	Supporting small and medium-sized firms in digital venture building, business building, and intrapreneurship. *Exemplary case: Renewing of an incumbent's traditional business model through the transformation of conventional office lights into data-driven lighting systems.*	I03*	CEO & Founder
		I04	Venture Partner
		I05	Venture Principal
C	Supporting incumbents in launching new ventures, intrapreneurship programs, and in-house venture builders. *Exemplary case: Development of an intermediary platform for 24-hour care together with a health insurance company.*	I06	CEO & Founder
		I07*	Senior Consultant
		I08	Senior Advisor
D	Co-creating digital B2B businesses together with leading global incumbents. *Exemplary case: Co-creation of IoT data platform that connects production data from different energy technologies and manufacturers.*	I09	CEO & Founder
		I10	Venture Architect
		I11	CEO Venture
E	Supporting incumbents in building new digital ventures and in-house venture studios but also found independent start-ups. *Exemplary case: Development of an online supermarket start-up with its own last-mile delivery service.*	I12	Venture Partner
		I13	Venture Architect
		I14	CEO Venture
F	Offering venture-building-as-a-service for small and medium-sized companies. *Exemplary case: Development of an AI start-up with an automated solution for data anonymization for a manufacturing firm.*	I15	Prior CEO & MD
		I16	New MD
		I17	Head of Venture Building
		I18	Prior Venture Architect & CEO Venture

Table 2. Case descriptions and interviewees with their roles (: public interview/podcast).*

Consistent with previous qualitative research in the IS discipline (e.g., Stein et al. 2015), we followed Myers (2019) for data analysis. Initially, the first author openly coded all interviews, highlighting interesting excerpts related to specific actions within the whole process. In the second step, the first and the second authors held a coding workshop where they engaged in descriptive coding, thus labeling the excerpts. At this stage, we tried to remain unbiased, let the data speak to us, and faithfully adhere to the informants' terms. For instance, we labeled the following quote with the descriptive code 'applying resource thinking': "*We have many situations where we approach things differently than the design thinking approach with something that could be called resource thinking. […] where a customer came to us and said we have developed a certain technology, to which market can we apply it?"* During this coding workshop, we further engaged in interpretive coding to look for theoretical interpretations and explanations for similarities, differences, and interrelationships between excerpts. Thus, we grouped the excerpt from the example with similar ones (see Table 3) and coded them with the interpretive code 'scouting available options'. Finally, together with all authors, we reevaluated and categorized the interpretive codes to the process steps according to the digital options framework (i.e., identify, develop, realize). By doing so, we realized that some excerpts relate to a stage currently not covered in the framework. Therefore, we revisited the current literature on digital options for suggestions. Since we did not find an adequate process, we labeled them ourselves as 'preparing for digital options thinking'. This process step includes activities designed to enable the incumbent to pursue digital innovation activities such as corporate venture building. Table 3 shows an exemplary extract of the coding.

Excerpts and descriptive code	**Interpretive code**	**Category**
Applying resource thinking. "We have many situations where we approach things differently than the design thinking approach with something that could be called resource thinking. […] where a customer came to us and said we have developed a certain technology, to which market can we apply it?"	Scouting available options	Identifying digital options
Matching internal resources with digital innovation trends. "Something is happening in the industry or this field, or a digital start-up is very successful. That should actually be even more efficient with the resources of Company XY."		
Topic validation. "What then happens is the so-called topic validation. It is a one-week sprint in which we want to check whether it is worth investing more resources and more money in this topic."	Evaluating available options	

Table 3. Coding scheme example.

4 Results

In this section, we will outline our findings along the phases of the digital options framework (i.e., identifying, developing, and realizing). Additionally, we structure each phase along the main interpretive codes that emerged during the analysis. As mentioned in section three, we realized that there is a fourth phase, which precedes the actual options thinking. Consequently, we start with this phase, labeled 'preparing for digital options thinking'.

4.1 Preparing for digital option thinking

To engage in digital options thinking, CVBs must first understand what the incumbent is looking for, how it usually works, and if it is ready to pursue venture building. Thus, in preparing for digital options thinking, the CVBs act as consultants seeking strategic alignment and setting up transparent governance.

Seeking strategic alignment. First, CVBs *elaborate on the digital innovation strategies* of incumbents. The importance of this factor runs through all our cases and is explicitly mentioned by ten respondents (I01, I03, I06, I07, I09, I12, I13, I15, I16, and I18). CVBs want to understand the incumbents' goals and intents regarding digital innovation and prove that venture building is the right tool for this endeavor. Two interviewees (I01, I12) deliberately position themselves not only as CVBs to prevent a solution bias. In their initial discussions with the incumbents, they make it clear from the outset that venture building is not the right solution for all situations. I12, for example, argues that it would make more sense for the German bank to enter into a partnership instead of developing a purely digital business model in online banking itself. Through workshops with the leadership team, interviews, and applying different frameworks, they analyze where the incumbents want to play. For instance, the CVB from Case C built its own digital value canvas to assess "a common view of the future" (I12):

> "It is a canvas for describing value creation in a digital project or a venture, where the company has to say: what do we actually want? Do we want to make new revenue with the venture? Do we want to build technology know-how with the venture? Do we want to use the venture to improve our own group equity story (…)" (I06).

In this way, they determine how willing the incumbent is to take risks and whether it is interested in digital business expansion (i.e., optimizing the core) or new business building (i.e., exploration). A clear strategy is also crucial for setting expectations and measurement criteria for success, i.e., governance, later on (e.g., I03, I15). Besides the general innovation strategy, the CVBs ask also for concrete ideas, problems, or topics the incumbents want to work on. They engage in collective topic-sourcing workshops with the leadership team or the existing innovation unit (I01, I09, and I015). Based on the insights regarding the digital innovation strategy, CVBs *examine the current organizational setup*. At this point, they need to elaborate on whether the incumbent firm can already handle its specific digital innovation goals. Consequently, they analyze people, processes, and organizational structures through gap analysis.

> "That [corporate venture building] does not work because the organizational setup that they currently have does not work. It also doesn't work with their processes, and in some cases, skills are also lacking, and that's where we come in, analyze that, and look at how it has to be done, so where do we stand now?" (I01)

First, regarding people, it starts right on the top (I05, I06, I08, I09, and I12). CVBs must link digital innovation efforts to managers at the top management level. Furthermore, they need to ensure that the time horizon of a venture-building project also corresponds to the contract term and the incentive structure of the respective manager. For example, I06 and I12 report cases in which projects were only terminated because there was a change of personnel in the responsible management position at the incumbent. To avoid such situations, it makes sense to distribute responsibilities among several people in the company (I08, I12). Besides the top management, the CVBs also look at the employees to ensure that they own an entrepreneurial mindset (I03, I09, and I15) and the respective capabilities (I01, I05, I12, I15, I16, and I17) to pursue venture building. Venture building requires, for example, designers, entrepreneurial product owners, developers, and growth hackers. Second, regarding processes, CVBs sometimes need to change or completely set up internal innovation processes to enable the incumbents to pursue venture building (I01, I06). For instance, incumbents often do not have the processes and the experience to start new ventures (I04, I06). They may have expertise in investing, i.e., buying stakes in already established start-ups. However, "the fact that an incumbent establishes a company with a 20 percent stake right from the start is something that most corporates do not yet have" (I06). Third, regarding organizational structures, CVBs sometimes realize that they need to change existing communication structures and responsibilities. If incumbents want CVBs to support the setup of intrapreneurship programs or in-house venture-building units, an overall restructuring need for the innovation unit may emerge. CVBs solve this issue by applying agile organization models (e.g., I01). Consequently, CVBs often act as strategic consultants in the first place. However, even if CVBs initially take on the role of an advisor, it is crucial to understand the difference between venture building and consulting. Thus, CVBs must *clarify the concept of corporate venture building*. The venture architect from case A (I02) explains that venture building needs enough time for idea validation and iteration. At the same time, consulting focuses on quick results and recurring and fixed update meetings. CVBs further emphasize the disadvantages of tight control by the incumbent and the importance of time when pursuing such an initiative (I09). After closing the gap between digital innovation strategy and its execution (i.e., strategic alignment), establishing a suitable governance structure for the venture-building project follows.

Setting up governance structures. To ensure fast decision-making during the whole process, CVBs *set up a steering committee* (I02, I06, I09, I10, I13, and I15). The committee comprises the incumbent's senior management, a partner of the venture builder, and an external advisor. While the senior management brings domain knowledge and financial resources, the partner of the venture builder owns consulting and entrepreneurial expertise. The external advisor is either an entrepreneur or a partner from another venture builder responsible for moderating between the incumbent (old world) and the emerging venture (new world). It is a person who also owns specific skills (e.g., business development, technological knowledge) and can be integrated into the operational business on a situational basis (I08). The steering committee acts as a kind of stage gate and decides whether an option should be activated or realized:

> "So the decision is always made according to the milestones, and the steering committee then says whether we should continue" (I10).

It is important to note that the steering committee only decides about the 'what,' while the venture architect decides about the 'how' (I02). The committee also discusses the *resource commitment* upfront. Corporate venture building only works if the incumbents provide access to the so-called "unfair advantage", i.e., unique corporate resources that can give a digital venture a real competitive advantage. Eight respondents (I03, I04, I06, I07, I09, I12, I13, and I15) mention this as the most critical component in corporate venture building. An unfair advantage can comprise various resources such as network (I05) technology (I06), customers and markets (I15), or specific capabilities (I03):

> "If you work with a retailer, for example, you have access to logistics and the supply chain. These are things that are otherwise not available to a new venture" (I13).

However, unfair advantages are not existing processes from the incumbent firm (e.g., human resources or finance). Such processes are often associated with lengthy decision-making processes and, therefore, unsuitable for a venture-building project (I06). An unfair advantage is any resource besides money (I04) that "helps you scale fast" (I03). The CVBs look for such resources in the following phase (i.e., identifying) and ensure the provision of those through formal contracts before developing digital options (I09).

4.2 Identifying digital options

The process of identifying options aims at recognizing already available options and activating them. Thus, this phase requires information availability (Fridgen et al. 2022). At this stage, CVBs assign venture architects as interim CEOs. Venture architects, i.e., people with entrepreneurial experience, then analyze internal and external resources and sense trends (i.e., scouting options). They also need consulting skills when evaluating those options against their desirability and feasibility for the incumbent.

Scouting available options. In contrast to traditional innovation approaches such as design thinking, CVBs *apply resource thinking* to scout initial opportunities for digital innovation. Thus, based on the first phase (e.g., preparing) where the incumbent highlights its innovation strategy and potentially exciting topics, they start by analyzing the incumbents' existing resources and capabilities. As mentioned above, the goal is to identify an unfair advantage first rather than focusing solely on the end user. Three respondents (I06, I12, and I15) deliberately distinguish their approach from design thinking:

> "We have many situations where we approach things differently than the design thinking approach with something that could be called resource thinking. […] where a customer came to us and said we have developed a certain technology, to which market can we apply it? What we see as a problem in the classic sense [corporate resource as legacy] doesn't necessarily have to be a problem. Established firms have several things that they can bring to the table" (I06).

When a potentially unfair advantage is found, venture architects from the CVBs start analyzing the market to *match internal resources with digital innovation trends*. Digital innovation trends can comprise specific technologies (e.g., AI) (I10) or digital business models (e.g., software-as-a-service) (I12). To do so, they use their analytics capabilities to screen databases such as PitchBook or Crunchbase:

> "We have our own analytics tool for that [trend scouting] where we can analyze which segments in which markets currently have the greatest potential. The key figures we are looking at are the funding and the timing of it, i.e., within the shortest possible time in the past, how much was invested in which areas." (IP13).

These activities result in a list of potential use cases or signals that are initially validated regarding their feasibility and desirability.

Evaluating available options. The venture architects from our sample (I02, I10, I13, and I18) describe the *topic validation* as a very structured process. Within weeklong design sprints, the CVBs analyze attractive industries and their value chains (I10), competitors, and potential target groups (I02) and conduct problem interviews (I13). At this stage, it is all about first indications and hypotheses to get closer to validating core hypotheses. Regarding feasibility, they develop something that I13 calls the "lean business log" (I13). It includes assumptions concerning market sizing, unit economics, technical feasibility, and a first business model. This log also includes information concerning cultural, regulatory, or political issues that may hinder a successful implementation of the future business model (I13).

Regarding desirability, they elaborate on whether the market is very competitive (e.g., I01 and I12) and whether cooperation or shareholding makes more sense than venture building (e.g., I03). Yet, evaluation is not only a matter of finding a relevant innovation lever but also of determining its consequences and implications on the incumbent firm. Thus, CVBs also engage in *scenario planning* to elaborate on uncertainties concerning the realization of particular options and respective handling strategies. The venture principal from Case A explains this very comprehensibly:

> "Take a gear manufacturer as an example – if the gears are now suddenly no longer sold as a product, but the business model changes towards equipment as a service. In other words, customers end up leasing these gears. Then it has implications for the entire sales unit, which was not even involved in this transformation project because up to now they had the incentive to get a commission on the gear-box sales" (IP01).

The evaluated options are then submitted to the steering committee together with the documents (i.e., lean business log and scenario planning). During so-called "do-or-die-sessions" (I15), the steering committee evaluates the problem-solution fit and the alignment with the incumbent's overall strategy and decides about activating specific options. Usually, several options are approved at this early stage, which are then evaluated in parallel in the next phase (I12). For instance, in the exemplary case from Case A, five of 12 digital business ideas were pushed into the development phase. However, based on the steering committee's feedback, the venture architects *prioritize the available options*:

> "These signals, which are then left on the shortlist, are discussed with the steering committee. They say 'ok here, we think these are particularly exciting and we'll tackle them first'. That does not mean that we only approach them, but that we take a closer look at them first" (I13).

4.3 Developing digital options

Developing an activated digital option prepares it for rapid market introduction (i.e., makes it actionable) (Svahn and Kristensson 2022). Within this phase, CVBs use their entrepreneurial expertise to bundle the identified unfair advantage and digital innovation trends into competitive actions. Thus, the CVBs staff an interim venture team that co-develops the first prototypes together with the incumbent's innovation unit for initial market testing.

Co-developing solutions. To develop possible solutions based on the activated options, CVBs rely on *cross-functional teams*. The various roles required are recruited in phases. As mentioned above, the venture architect is the first person to be involved from the topic validation stage onwards and takes over the project. A designer, product owner, and growth hacker then follow him or her, for example, in the development phase and a software developer in the realization phase:

> "We firmly believe in cross-functional teams. We believe in creating a team of different people who bring in elements from different directions. Starting with a venture architect. It's pretty typical to bring in someone who is ultimately the interim CEO, who has to get the whole thing up and running. They make sure that everyone in the team contributes the right things. This includes product owners, growth hackers, designers, and developers who can code the whole thing quickly. The venture architect starts with the topic validations. Every time we go into the next phase, for instance, prototyping, we get more people on board when we need them" (I12).

As soon as the option is actually realized and, for example, a new start-up is to be founded, people with expertise in financing, recruiting, and legal issues are also brought in (I03). The CVB usually provides all of these team members. However, six respondents (I01, I05, I07, I15, I16, and I17) also highlight the importance of *involving the incumbent's employees*. This ensures early commitment, the development of digital innovation capabilities, and successful implementation at the end of the project because "the more you involve them, the more they feel it's their project, and the more they also start fighting for it" (I16). Such involvement can range from just providing updates (e.g., I05, I16) to incorporating the incumbent's employees operatively (e.g., I07). In all our cases, transparent communication is the most critical factor in building relationships with the incumbent's employees. To help them build their own digital innovation capabilities, CVBs further give workshops on agile working and design thinking and conduct small intrapreneurship programs (I05). The necessary knowledge for the operative involvement is implemented through learning by doing (I13), job shadowing (I01), and dedicated programs:

> "But if it's the fully-fledged package, then we take motivated employees or employees from different departments from the incumbent and develop the business model together with them hands-on over three months in a weekly rhythm – that's what we call a campus" (I07).

Regardless of the employees' operational involvement, *an internal champion* is always needed (I01, I04, I05, I10, and I13). This person is usually from middle management and has the power to create access to other company resources and assets. These resources are, for instance, access to customers for problem interviews or specific personnel with specific domain knowledge relevant to further developing digital options (I13). The internal champion is also responsible for setting up transparent communication structures between the CVB and the incumbent (I10).

Lean prototyping. This co-development aims to create prototypes that are then validated regarding the *product-market fit*. In contrast to achieving problem-solution fit (see section on identifying digital options), ensuring the product-market fit is about the product itself. The question is, therefore, whether the product with its specific features solves the identified problem (I13) and whether the customer is willing to pay for it (I05, I12, and I15). 'Lean' means that it is a click dummy rather than a hard-coded product (I12). These prototypes are validated, for instance, through landing page smoke tests (I13), lead user tests (I02), and solution interviews (I10). At this stage, CVBs often have to *overcome the cultural short-termism* of incumbents again. Since CVBs work closely with incumbents and seek to build ventures pursuing digital innovations relevant to the existing core business, CVBs must achieve fast and measurable results:

> "We always say we don't build MVPs, we build MBPs, Minimum Billable Products (...) It is first of all an economic component that is in the foreground. That means we have to get traction very quickly, we have to have the first paying customers" (I04).

This is further reinforced by the fact that many corporates see "the whole thing [corporate venture building] as a consulting project, but just with a cool digital fancy label" (IP02). As a result, some incumbents still have these clear timelines from consulting in mind even after strategic alignment (see section on preparing for digital options thinking). According to the CEO & founder of Case D, this is based on a false message spread by some venture builders in the market:

> "They've developed methods where they come up with ideas super-fast, but they haven't really thought it through very well. Because if they thought it through properly, they would need a lot of time and depth, and then somebody would have to pay for it" (I09).

The venture architect from Case A, a former independent founder, further argues that this circumstance can lead to funding issues for the new ventures and product-market fit problems at the end of the developing phase since one does not know at the beginning how complex the solution will be or who the actual stakeholders and users are. Based on the product-market fit, the steering committee then decides whether to realize the activated options

4.4 Realizing digital options

"Unless actionable options can be rapidly transformed into products and services, efforts may be in vain" (Svahn and Kristensson 2022, p. 8). Thus, realizing activated options aims to implement valuable digital options rapidly. Investments must be taken to successfully launch a minimum viable product

(MVP) and hand over the whole project to the incumbent or spin it off as a start-up. Regardless of the type of outcome, CVBs ensure operational readiness and support for the future CEO of the project.

Operational readiness. To ensure operational readiness, CVBs *support the staffing of the future venture team*. They primarily search for a CEO and a CTO in the first place (I06). The importance of finding a future CEO is the top priority mentioned in all our cases. It needs to be a person with an entrepreneurial mindset but not an entrepreneurial ambition. Hence, CVBs are looking for so-called second-stage entrepreneurs who are good at scaling an already validated business model based on an idea that is not theirs:

> "What makes a good founder is that the original idea (…) doesn't even have to come from him. He just has to be enthusiastic about" it (I06).

Although most CVBs own an excellent network (I06, I09), this task is described as one of the most challenging (I01, I06, I09, I12, I13, and I15). Consequently, in some cases, the venture architect (the interim CEO responsible for the project since the identification phase) transitions into the new venture. For instance, I18 from Case F was a former venture architect who took over the start-up.

> "There is always the option that someone from the venture team, or generally someone from the CVB, also goes along and spins it off. (...) In the spin-offs we have had so far, at least one person from the venture team has joined the customer project and helped spin it off" (I13).

Further, the CVBs also *provide IT capabilities*. They connect the venture team to freelancers (e.g., I01) or provide their own developers (e.g., I06, I11). Usually, the technical support remains in place until the first MVP is launched. Thus, they also support in prioritizing the technical features (I10).

Supporting the future CEO. When the future CEO is found, it is necessary to help them. First, this involves *coaching*. The CVBs show them how to communicate their ideas to the incumbents (I01), how to set up a suitable organizational structure for the new venture (I06), and provide mental support (I09):

> "No matter how strong they seem, everyone will reach mental sticking points. We see them, we know them before they even see for themselves that they are in there, so to speak" (I09).

In this context, the CEO of the venture in case D (I11) explained how the CVB was able to act like a "protective wall" because it exerted influence on the incumbent at the political level and took over the *communication between the incumbent and the venture*. As CVBs consist of former entrepreneurs and corporate employees, they know both sides well and have learned how to speak both languages. Consequently, the CEO from case D continued:

> "They made stakeholder management very active. Therefore, the connection between the company's decision-makers and the CVB was close back then. It was a very close relationship of trust. They have been talking and talking and working things out together for a long time" (I11).

5 Discussion

This paper aims to answer the question of how CVBs generate digital options for incumbents. We identified several activities and capabilities along the digital options thinking framework necessary to ensure successful digital options generation within CVBs. Furthermore, we uncovered a fourth phase that precedes the actual digital options thinking in the context of digital innovation (i.e., preparing for digital options thinking), which is necessary to ensure the implementation potential of corporate venture building. During the analysis, we also unraveled distinct roles required to successfully transition the digital option from being available to realized. These are strategic consultants, serial entrepreneurs, internal champions, and second-stage entrepreneurs. In the following, we present these roles and discuss their implications for generating digital options.

Strategic consultants. "Corporate venture building has two elements. One is the actual 'building'. In other words, building, founding, and getting it off the ground. With the whole entrepreneurial aspect. And then, yes, it also has consulting approaches. Because we always work at the interface between building something new and the entrepreneurial side" (I03). Even though consultants have often been discredited, especially in entrepreneurship, they play an important role, particularly in the first two phases of generating digital options. First, due to their prior experience in analyzing the innovation needs and transformational hardships in incumbents, they can align different assumptions and expectations in the context of digital innovation. By doing so, they set the stage for identifying available, strategically relevant options. Furthermore, since successful digital options generation requires access to the existing resources of the incumbent, they ensure resource commitment early on. To avoid implementation hurdles at the end of the venture-building project, they establish steering committees, which act as stage gates at the end of each process step. Second, due to their involvement in the preparing stage, strategic consultants know the intentions of the incumbents. Thus, they are essential when evaluating the available options recognized by the venture architects in the identification phase. Thus, strategic consultants are responsible for creating the foundations for recognizing available options.

Serial entrepreneurs. Strategic alignment is critical, but after the preparing phase, available options must be identified, developed, and realized quickly. 13 respondents in our sample have already founded a company at least once. They bring in the necessary experience and skills to create novel economic activities. Serial entrepreneurs own alertness (Sambamurthy et al. 2003) that is necessary to recognize valuable incumbent resources and sense external trends. These capabilities are crucial when identifying digital options (Svahn and Kristensson 2022). Furthermore, they know what kind of people they need at what stage. Consequently, they are experts in building well-functional venture teams in the development phase. Thus, serial entrepreneurs are essential for making digital options available and actionable.

Internal champions. Although strategic consultants seek to ensure resource commitments right up front, it is crucial for successful options generation that access to incumbent resources is given when it's needed. Internal champions are well-connected managers who own the power and legitimacy to create access to company resources and assets. They are especially relevant when the steering committee decides to activate options and venture architects start to create potential competitive actions. These people need to be able to access various resources: "And what you need for this are so-called internal champions within the incumbent. A person or a business unit that says: 'We are taking responsibility for this venture building. We're opening the doors to all the other units. We enable you to operate within a legal framework. We give you access to the legal department. We give you access to personnel. To the supply chain. To all sorts of things. That's a catalyst for faster venture building if it's in a corporate environment" (I03). Thus, with serial entrepreneurs, internal champions are essential for activating digital options.

Second-stage entrepreneurs. As mentioned above, these entrepreneurs usually enter the venture-building process after the development stage but own the competence to scale an already validated digital business model. These are digital-experienced, creative, and risk-taking corporate employees who are still relatively new to the incumbent and are not yet too entrenched in structures and ways of thinking or domain experts (I01). However, they can also be experienced external entrepreneurs who do not like the idea generation phase or can no longer afford to be found independently, e.g., due to family commitments requiring a more stable income. This type of entrepreneur seems to fit corporate structures better as they have already gained experience with different stakeholders, seek mutual understanding, value the strengths of both parties and still have the incentive to build. Consequently, they differ in mindset and act collaboratively rather than idealistically. The following quote from one venture CEO of our sample illustrates this:

> "I don't like the early-stage phase at all. (...) It wasn't that important to me to become a full-fledged co-founder. It's also okay for me to go into a corporate start-up that has just closed the seed round and now looks for a CEO for the scaling phase" (I14).

Thus, second-stage entrepreneurs are essential for realizing digital options. Table 4 below gives an overview of the roles, capabilities, and activities within each phase of the digital options thinking process.

The current IS literature lacks knowledge on how separate innovation units can *capitalize* on internal resources, combine them with external ones, and pursue competitive actions with digital technologies (Fridgen et al. 2022; Oberländer et al. 2021). This paper reveals a first approach to address this problem and provides two theoretical contributions. First, we add to the existing IS literature on digital options (e.g., Rolland et al. 2018; Sandberg et al. 2014) by examining digital options thinking in the context of digital innovation. Through the analysis of the digital options generation process within CVBs, we uncovered the necessary fourth step in the context of digital options thinking (i.e., preparing). Prior literature mainly used this approach to investigate investments in IT capabilities (Sandberg et al. 2014). However, solely investing in a new technological infrastructure is not enough to tackle the challenge of digital innovation (Wiesböck and Hess 2020). Based on our interviews, we stress the importance of examining the existing organizational structures, processes, and business models before investing in specific IT capabilities. Furthermore, by outlining particular roles, we provide a more granular view on how digital options transition from being available to realized. With these roles and the specific activities and capabilities identified, we add, as a second contribution, also to the literature on digital innovation units and venture builders (e.g., Mittermeier et al. 2022). Research of digital innovation units (e.g., Hund et al. 2021) often stops right after the prototyping phase. Thus, we do not know how incumbents can capitalize on digital innovation opportunities generated in such units (Oberländer et al. 2021). This fact is one of the main reasons such units fail (Lau et al. 2021). By highlighting how CVBs realize digital options into novel economic opportunities, we give insights into how incumbents can capitalize on the opportunities generated in separate innovation units. Besides the theoretical contributions, the results can also be helpful for practitioners. Prospective CVBs can use the identified roles as a guide when putting together their teams. For the management of incumbents, we show the difference between consulting and venture building and thus create a better understanding of what is needed to build new digital businesses.

<table>
<tr><th></th><th>Essential roles</th><th>Capabilities</th><th>Actions</th></tr>
<tr><td rowspan="5">Preparing</td><td rowspan="5">Strategic consultants</td><td rowspan="3">Seeking strategic alignment</td><td>Elaborating on the digital innovation strategy</td></tr>
<tr><td>Examining the current organizational setup</td></tr>
<tr><td>Clarifying the concept of corporate venture building</td></tr>
<tr><td rowspan="2">Setting up governance structures</td><td>Setting up a steering committee</td></tr>
<tr><td>Ensuring resource commitment</td></tr>
<tr><td rowspan="5">Identifying</td><td rowspan="5">Strategic consultants & serial entrepreneurs</td><td rowspan="2">Scouting options</td><td>Applying resource thinking</td></tr>
<tr><td>Matching internal resources with digital innovation trends</td></tr>
<tr><td rowspan="3">Evaluating available options</td><td>Conducting topic validation</td></tr>
<tr><td>Engaging in scenario planning</td></tr>
<tr><td>Prioritizing available options</td></tr>
<tr><td rowspan="5">Developing</td><td rowspan="5">Serial entrepreneurs & internal champions</td><td rowspan="3">Co-developing solutions</td><td>Setting up cross-functional teams</td></tr>
<tr><td>Involving the incumbent's employees</td></tr>
<tr><td>Assigning internal champions</td></tr>
<tr><td rowspan="2">Lean prototyping</td><td>Ensuring product-market fit</td></tr>
<tr><td>Overcoming cultural short-termism</td></tr>
<tr><td rowspan="4">Realizing</td><td rowspan="4">Serial entrepreneurs & second-stage entrepreneurs</td><td rowspan="2">Operational readiness</td><td>Supporting the staffing of the future venture team</td></tr>
<tr><td>Providing IT capabilities</td></tr>
<tr><td rowspan="2">Supporting the future CEO</td><td>Coaching</td></tr>
<tr><td>Guiding communication between incumbent and new venture</td></tr>
</table>

Table 4. Essential roles, capabilities, and actions during digital options thinking within CVBs.

6 Limitations and Conclusion

Our paper is not free of limitations. First, we only include CVBs from the DACH region. Similar research in other geographies is needed to test the findings' validity and generalizability. Second, we only have independent CVBs in our sample. Researching corporated-backed CVBs may lead to different results. For instance, since corporate-backed CVBs are corporate-owned, they may not face the 'venture building as consulting project problem' and may differ notably in the stage of preparing for digital options thinking. Thus, we encourage future research to explore the differences in corporate venture-building approaches. Further, scholars who want to build on our results and investigate independent CVBs, should particularly examine the model's sustainability. As the venture architects (with their expertise) often leave the CVBs to join the new ventures, it is questionable how this loss of expertise can be compensated for. Finally, we must highlight two limitations of our data analysis strategy. First, by adopting a digital options perspective, we may have neglected other critical aspects of digital opportunity generation, such as routines. In line with this, despite several authors involved in the data analysis, subjectivity biases cannot be ruled out. Second, there might be a risk of information bias due to the chosen case study design. Even though multiple case studies usually provide a better basis for theorizing (Eisenhardt and Graebner 2007), they risk obscuring unique case-specific features.

To conclude, our research outlines several actions and capabilities along the digital options framework and highlights four specific roles necessary to generate digital opportunities in external digital innovation units. These roles are essential to identify, develop, and realize a digital option and, thus, to pursue competitive actions with digital technologies.

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