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Managing start-up – incumbent digital solution co-creation: a four-phase process for intermediation in innovative contexts

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ABSTRACT

As incumbents strive to collaborate with start-ups in the pursuit of cutting-edge digital solutions, the complexities posed by disparate partners and their innovative endeavours often lead to intricate tensions. Our research underscores the critical role of innovation intermediaries in enabling a successful digital co-creation, yet a deeper understanding of this novel and evolving context is required. Through a comprehensive study of two innovation intermediaries, five incumbent companies, and eleven start-ups, we shed light on how intermediaries can effectively mitigate the hard-to-manage tensions that emerge. Our analysis uncovers three primary tensions: incompatible digital co-creation cultures, divergent digital innovation operations, and misaligned technical capabilities. We further propose a four-phase process for innovation intermediation, including the establishment of digital co-creation foundations, catalysing digital innovation projects, orchestrating the co-creation process, and scaling the resulting outcomes.

1. Introduction

Organisations across industries are faced with new demands for innovation and growth due to the rapid development of digital technologies, such as artificial intelligence (AI) or the Internet of things (IoT) (Björkdahl 2020). This situation challenges incumbents, whose product-centric mindset and limited digital capabilities constrain their ability to leverage and exploit digitally enabled opportunities (Kamalaldin et al. 2021; Linde et al. 2020). Accordingly, incumbents are increasingly engaging in co-creative digital innovation projects with start-ups in pursuit of developing novel digital solutions (Kurpjuweit and Wagner 2020; Sjödin, Parida, and Visnjic 2022). Joint digital innovation outcomes include new products and services, made possible through the use of digital technologies and processes, being such outcomes digital, physical, or adaptable to specific use contexts (Nambisan et al. 2017). Thus, examples of such digital solutions could include a platform-based service to monitor CO_2 emissions or a camera device with specific fault reporting technology. However, these joint development efforts often fail due to the

increased complexity of digital co-creation, leading to the emergence of hard-to-manage tensions (Barrett and Tsekouras 2022). For instance, data sharing and cybersecurity concerns constrain the degree of transparency between the parties (Sjödin et al. 2021), reducing the potential value of the resulting digital solution. Thus, while start-up – incumbent digital co-creation holds the potential of instigating innovation in traditional industries, contextual challenges associated with the nature of digital technologies (and its applications) represent a barrier to the successful development, implementation, and commercialisation of digital solutions.

To this background, we argue that the innovative context of start-up – incumbent digital co-creation represents an important avenue to expand our understanding of innovation intermediation. Innovation intermediaries refer to entities that operate in the domain of innovation processes in-between different parties, establishing, nurturing, and empowering the achievement of joint innovation outcomes (Howells 2006; Hernández-Chea et al. 2021; Kant and Kanda 2019). Examples of innovation intermediaries in prior research include consultants (i.e. Bessant and Rush (1995)), for-profit organisations (i.e. Klerkx and Leeuwis (2008)), incubators (i.e. Hansen et al. (2000)), and accelerators (i.e. Kohler (2016)), among others. Prior studies have explored several innovation settings, where innovation intermediaries provide support in the form of brokering business-to-business innovation (Blanka and Traunmüller 2020), shaping business-to-user innovation adoption in emerging markets (Stewart and Hyysalo 2008), and enabling the transition to a circular economy in so-called protected spaces (Barrie, Zawdie, and João 2017). Thus, research on innovation intermediation is quite fragmented and, most importantly, the current literature offers little insight into the innovative context of start-up – incumbent digital co-creation, leading to two main research gaps.

First, *there is a limited understanding of the specific tensions threatening the success of start-up – incumbent digital co-creation*. Indeed, digital co-creation is more prone to the emergence of hard-to-manage tensions in start-up – incumbent interactions. This is an important area of inquiry because tensions have a direct effect on the behaviour of the parties, which can turn into both negative or suppressive reactions and creative responses (Ritala et al. 2017). We posit that start-up – incumbent digital co-creation aimed at leveraging the newest wave of digital technologies is associated with high uncertainty and unpredictability. Here, the lack of prior experience of the parties poses an increased risk of failure, aggravating the inability to effectively assess and respond to the emerging tensions (Paiola et al. 2021). Thus, specific insights into these tensions and their emergence in the context of innovative digital co-creation are needed.

Second, *there is a lack of understanding of how innovation intermediaries manage start-up – incumbent digital co-creation*. Indeed, while the literature on innovation intermediaries is growing, there is a scarcity of studies directly addressing their role in digital innovation. We contend that innovation intermediaries are a crucial factor in enabling a successful digital co-creation. Arguably, the emergence of tensions will vary throughout the parties' interactions, requiring specific attention from the intermediary to adapt their support accordingly (Blanka and Traunmüller 2020). For instance, Czakon and Czernek (2016) show how third-party legitimisation represents the strongest trust-building mechanism enabling initiation of co-creation between otherwise competing actors. Yet, a detailed understanding of how innovation intermediaries deploy specific support

from the early phases of start-up – incumbent interactions to the later commercialisation of digital solutions is lacking. Thus, understanding how innovation intermediaries manage the start-up – incumbent digital co-creation process and resulting outcomes constitutes a significant managerial concern and represents a gap in the literature.

This study explores innovation intermediation in start-up – incumbent digital co-creation, focusing on how intermediaries mitigate the emerging tensions between the parties over the entire process. To do so, we seek answers to the following research questions:

RQ1. What tensions emerge in start-up – incumbent digital co-creation?

RQ2. How do innovation intermediaries mitigate tensions in start-up – incumbent digital co-creation?

To achieve this purpose, the present study is based on two in-depth case studies, comprising two innovation intermediaries and their associated ecosystems of start-ups and incumbents. We explore tensions and intermediation processes, drawing on a total of 30 interviews from informants in two intermediaries, five incumbents, and 11 start-ups engaged in digital co-creation.

The findings identify the prevalence of three main groups of tensions emerging in start-up – incumbent digital co-creation namely, *incompatible digital co-creation culture*, *divergent digital innovation operations*, and *misaligned technical capabilities*. In addition, we identify a process for innovation intermediation in start-up – incumbent digital co-creation consisting of four distinct phases namely, *1) establishing digital co-creation foundations*, *2) catalysing digital innovation project*, *3) orchestrating digital co-creation process*, and *4) scaling digital co-creation outcomes*. Each phase includes specific mechanisms deployed by intermediaries to mitigate the tensions emerging between the parties.

Overall, this study advances the literature on innovation intermediation, focusing on the contemporary and increasingly relevant context of digital co-creation. In particular, this study expands current knowledge conceptualising a process framework for innovation intermediation, revealing a holistic understanding of the emergence and mitigation of hard-to-manage tensions in start-up – incumbent digital co-creation. From a managerial viewpoint, the findings outlined in this study call for start-ups to explicitly and continually communicate requirements to validate the digital solution and for incumbents to develop an internal digital co-creation culture to reduce the likelihood of emerging tensions. The insights provided also emphasise the need for innovation intermediaries to be active, beyond early engagement and across the four phases identified for effective intermediation in start-up – incumbent digital co-creation.

The paper is structured as follows. It begins with an introduction on the context and purpose, followed by a section on the theoretical background of the study. The method is then presented, including the empirical data collection and analysis process, and proceeds to

reporting the findings. The paper concludes with a discussion of the theoretical contributions and managerial implications, along with limitations and avenues for future research.

2. Theoretical background

2.1. Digital co-creation: characteristics and relevance

Incumbents are leveraging new technologies and their applications to become more competitive in the current digitalised and global marketplace (Naik et al. 2020; Kohtamäki et al. 2022). For instance, autonomous solutions are transforming the traditional handling and management of vehicles in the mining industry (Sjödin, Parida, and Visnjic 2022). However, incumbents face internal rigidity and organisational inertia, challenging their ability to explore and exploit the potential that digital technologies have to offer (Steiber and Alänge 2021). In this context, digital co-creation with start-ups emerges as a way for incumbents to leverage the opportunities that digital technologies provide to develop, implement, and commercialise innovative solutions (Prashantham and Kumar 2019; Weiblen and Chesbrough 2015). For example, incumbents in traditional manufacturing industries are increasingly seeking to collaborate with hi-tech start-ups to advance their digitalisation efforts (Linde et al. 2021).

Co-creation has been explored and understood from several perspectives, including relationship marketing (Payne, Storbacka, and Frow 2008), networks (Chandler and Vargo 2011), and service logic (Vargo, Maglio, and Akaka 2008). In this study, co-creation is defined as high-quality interactions that enable shared experiences between specific parties as a way to unveil new sources of competitive advantage (Prahalad and Ramaswamy 2004b). Intrinsic to co-creation are the need for transparency – to enable trust and knowledge sharing between the parties (Prahalad and Ramaswamy 2004a), organisational learning – to understand each other's processes, operations, and resources (Grönroos and Voima, 2013), and openness – to allow for continuous adaptation and alignment of the parties' interests and goals (Ranjan and Read 2016). For the purpose of this research, we focus on digital co-creation, which adds the uniqueness and uncertainty of new technologies (and its applications) to the parties' interactions and outcomes.

Digital co-creation implies higher complexity, which can hinder the success of incumbents' and start-ups' interactions. For instance, data sharing and cybersecurity concerns limit the degree of transparency (Sjödin et al. 2021), potentially leading to lower value digital outcomes. Similarly, the limited prior technological knowledge of incumbents is seen as a challenge to organisational learning (Paiola et al. 2021), which can supress the performance improvements of digital co-creation efforts. Lastly, the commercialisation of the resulting innovation is not exempt from challenges, where disagreements over intellectual property rights or power imbalances in licencing agreements can diminish digital co-creation returns (Baloutsos, Karagiannaki, and Pramatari 2022; Carayannopoulos 2009). This additional complexity lays the basis for hard-to-manage tensions to emerge throughout the parties' interactions.

We argue that digital co-creation deserves special attention, where little is known about how to best manage the tensions that pose a threat to the success of the process. Tensions are seen to negatively impact the progression and achievement of desired digital outcomes (Barrett and Tsekouras 2022). While tensions are inherent to co-creation

(Payne, Storbacka, and Frow 2008), the digital aspect places additional pressure on the parties, who struggle to respond and address them on their own (Weiblen and Chesbrough 2015). In this context, the intermediation of a third-party independent actor known as an innovation intermediary is becoming increasingly crucial.

2.2. Innovation intermediaries: characteristics and relevance

Innovation intermediaries are entities that operate in the domain of innovation processes in between different actors (Kant and Kanda 2019). Previous studies have explored innovation intermediaries under several forms (e.g. consultants, universities, incubators) and co-creation contexts (i.e. business-to-business, business-to-user, networks), leading to fragmented knowledge about this phenomenon (Howells 2006). Even though the variety of entities and settings, an innovation intermediary, generally, is known to facilitate interactions, safeguard the parties' interests, and facilitate the accomplishment of co-creation goals (Corvello et al., 2021). Prior research has demonstrated the relevance of intermediaries for the successful co-creation of market innovations. Johnson (2008), for instance, shows how innovation intermediaries enable regional technology developments between the public and private sectors. Klerkx and Leeuwis (2008), on the other hand, explored how innovation intermediaries channel innovation demand and supply in the agricultural sector. Given their growing presence and ability to support technological innovations, the relevance of intermediaries in start-up – incumbent digital co-creation is seen as a key area for further research.

Looking into how innovation intermediaries support and enable co-creation, studies have suggested some categories of main roles namely, brokering, configurating, and facilitating. First, a brokering role constitutes the identification and articulation of the parties' needs, or the scanning and matchmaking of potential co-creation projects (Blanka and Traunmüller 2020; Klerkx, Hall, and Leeuwis 2009; Martiskainen and Kivimaa 2018). Second, a configurating role addresses technology adjustments, or the accreditation and evaluation of outcomes (Barrie, Zawdie, and João 2017; Hernández-Chea et al. 2021; Kant and Kanda 2019). Lastly, a facilitating role is concerned with creating spaces and opportunities for action, or influencing rules and regulations (Barrie, Zawdie, and João 2017; Kant and Kanda 2019; Martiskainen and Kivimaa 2018). However, the innovative and uncertain context characteristic of start-up – incumbent digital co-creation requires an overarching and deeper view of intermediation.

First, the study of innovation intermediaries has mainly contributed to our understanding of how to best support the parties' engagement (De Groote and Backmann 2020; Kurpjuweit, Wagner, and Choi 2021), whereas later phases in the co-creation process can otherwise neglected tensions (Hogenhuis, van den Hende, and Hultink 2016; Martiskainen and Kivimaa 2018). This is of particular importance in the context of digital co-creation, where the lack of prior experience increases the likelihood of hard-to-manage tensions as milestones are reached.

Second, while innovation intermediaries can adopt a role at a specific moment in the co-creation, those roles can also be deployed in combination with others throughout the co-creation process (Kant and Kanda 2019). Indeed, the high degree of complexity in start-up – incumbent digital co-creation may benefit more from a combination of actions and mechanisms deployed over several phases. Thus, there is a need for further research

to understand how innovation intermediaries effectively manage such ad-hoc digital innovation projects.

To conclude, the present study adopts a definition of innovation intermediary in the form of an independent and knowledgeable entity that allows us to satisfy the need for further research in the context of digital co-creation. In other words, we do not consider single-role intermediaries, such as connecting entities (i.e. matchmaking organisations or platforms) or growth entities (i.e. accelerators or incubators), but focus on intermediaries that support start-ups and incumbents from early interactions through to the resulting digital outcomes. Thus, we seek to extend the understanding of innovation intermediation beyond the brokering role and into the facilitating, configuring, and overall orchestrating of the parties' digital co-creation.

3. Method

3.1. Research design

This paper presents a qualitative research design, based on two in-depth case studies. The choice of qualitative research follows previous studies on tensions, where inductive and exploratory work has been proven to allow for a richer understanding of phenomena (Burton et al. 2016; Ritala et al. 2017). The role and impact of innovation intermediaries is under constant change and evolution, making a qualitative case study the most appropriate approach to study the phenomenon (Gephart and Rynes 2004). The lack of theoretical anchoring in the present study calls for a case study approach to uncover new insights in the early explorative stages of theory development (Edmondson and McManus 2007). In addition, multiple cases allow to draw evidence from several settings, adding both breadth and depth to the understanding of complex relational processes in digital co-creation (Eisenhardt 1989; Eisenhardt and Graebner 2007).

The goal is to identify and understand start-up – incumbent tensions and innovation intermediaries' mitigation mechanisms throughout the digital co-creation process. We investigate the role and impact of innovation intermediaries before, during, and after specific start-up – incumbent digital innovation projects in real-life contexts. Unlike other literature that considers only the engagement phase, this study responds to the need for further research over the entire digital co-creation process (Blanka and Traunmüller 2020), enabling a deeper understanding of the interactions relevant to the emergence of tensions and its mitigation. Through the qualitative analysis of two representative cases, the present study examines the tensions and underlying complexity that arise in start-up – incumbent digital co-creation, and how tensions can be mitigated through specific third-party mechanisms implemented by an innovation intermediary.

3.2. Case selection and sampling strategy

To answer the RQ, we selected two cases of intermediaries formally orchestrating start-up – incumbent innovation ecosystems who corresponded to the theoretical description of innovation intermediary. We followed a purposive sampling strategy (Miles and Huberman 1994; Yin 2014) to ensure that the cases yielded a rich and diverse data set, where the selection criteria reflected three main factors. First, as tensions emerge from

the interactions that extend beyond the initial engagement of the parties (Galati et al. 2021), cases should allow data capture throughout the digital co-creation process. Second, since digital co-creation is more prone to lead to tensions under higher levels of uncertainty (i.e. the parties' lack of previous experience) (Paiola et al. 2021), cases should allow examination of novel start-up – incumbent digital innovation projects. Finally, as innovation intermediaries can mitigate a wide range of tensions within a specific co-creation process (Kant and Kanda 2019), cases should allow for a broad interpretation of mechanisms that constitute a mitigation.

The cases selected (Alpha and Beta) are identified as leading innovation intermediaries in Sweden, focusing on the orchestration of ecosystems for the co-creation of digital solutions. Such ecosystems comprise a network of large international incumbents and a continuous scouting of digitally driven start-ups, where digital innovation projects emerge and evolve, allowing for the exploration of tensions in the process. Alpha and Beta's knowledge and experience can be seen in their formalised support programs and initiatives, allowing for the exploration of mitigation mechanisms as independent third-party actors throughout the co-creation.

3.3. Data collection

Data for the present study was primarily gathered through in-depth interviews with informants from each case. The unit of analysis was the impact of innovation intermediaries throughout the start-up – incumbent digital co-creation. Data was collected following a semi-structured interview protocol (Patton 1999) to allow for insights to emerge over the course of the interview. Here, the main goal was to build theory rather than to test specific hypothesis. Interviews provided the necessary information on how the digital co-creation took place from the perspective of the three main actors in our study namely, innovation intermediary, incumbent, and start-up.

The main topics in start-ups and incumbent interviews included questions on a) the role and experience of the informant; b) how digital co-creation is managed in the organisation; c) specific digital innovation projects exploring engagement, development, and future plans; d) main challenges, impact on co-creation, and how those were addressed; e) feedback and degree of satisfaction with the digital outcomes and support received from the intermediary. Main topics in the intermediary interviews included questions on a) the role and experience of the informant; b) the strategy, goals, and vision of the organisation; c) the programs, processes, activities, and roles supporting the development of start-ups' and incumbents' digital co-creation; d) identified barriers and opportunities in current support.

During the interviews, instruction was given to reflect on their experience as either mediating the co-creation or being one of the main parties to reveal their expectations, goals, milestones, and challenges throughout the process. Discussions were fostered and extended, departing from specific questions to explore interesting and emerging themes. This flexibility ensured wide coverage of the phenomenon (Yin 2013), providing the opportunity to include aspects that otherwise would have been missed under a strict protocol.

Informants were selected following purposeful criteria, characteristic of qualitative research, rather than using a random selection technique (Creswell and Poth 2013).

Using purposeful criteria, we were able to explore innovation intermediation under analogous complex start-up – incumbent digital innovation projects, providing us with sufficient data to extract theoretical insights into the digital co-creation, tensions, and innovation intermediation literature (Eisenhardt 1989; Glaser and Strauss 2008; Strauss and Corbin 1990).

First, we consciously selected digital innovation projects where processes and outcomes were unknown to the parties (i.e. lack of established protocols) in order to capture data that exemplified significant and hard-to-manage tensions. This allowed us to ensure a consistent analysis of novel digital co-creation experiences despite the diversity of start-ups' digital technologies and incumbents' industries. Second, informants hold strategic and managerial level positions who took on leading roles and were actively involved in the co-creation process. This allowed us to achieve an in-depth understanding of the goals, expectations, milestones, outcomes, and challenges experienced by start-ups and incumbents, as well as their evolution and management over the duration of the process.

Table 1. Participant organisations, number of interviews, and informants.

INTERMEDIARIES		
Alpha	*Intermediary focused on supporting start-up – incumbent digital co-creation processes.*	Head of Business Development (3)
Beta	*Intermediary focused on supporting start-up – incumbent digital co-creation processes.*	CEO (2), Project Manager (2)
INCUMBENTS		
Incumbent A	*Manufacturer and provider of products and solutions for safe and sustainable electrification.*	Digital Ecosystem Manager (3), Digital Lead (2)
Incumbent B	*Manufacturer and provider of industrial vehicles for transportation, storage, and sorting.*	Strategic Innovation Director, Strategic Innovation Program Manager
Incumbent C	*Manufacturer and provider of production, cultivation, growing, and harvesting machinery.*	Product Development Director
Incumbent D	*Manufacturer and provider of safety and security products, services, and solutions.*	Technology & Innovation Manager
Incumbent E	*Manufacturer and provider of turbines, generators, and transformers for the energy sector.*	Innovation and Intrapreneurship Developer
START-UPS		
Start-up 1	*Developer and provider of technology to enable sustainable charging of devices.*	CEO and Founder
Start-up 2	*Developer and provider of technology to monitor and track different sources of energy.*	CEO and Founder (2)
Start-up 3	*Developer and provider of cloud-based system to enable sustainable transition of organisations.*	Founder
Start-up 4	*Developer and provider of automated technology to enable efficient and effective customer support.*	Head of Sales and Accounts
Start-up 5	*Manufacturer and provider of electric road system for transportation*	CEO
Start-up 6	*Developer and provider of data analytic tools and solutions.*	COO and Founder, Data Scientist
Start-up 7	*Developer and provider of sustainability technology awareness and connecting system.*	CEO and Founder
Start-up 8	*Developer, manufacturer and provider of cutting-edge robotic products and solutions.*	Chief Design Officer
Start-up 9	*Developer and provider of own digital engineering intelligence assistant product*	Founder
Start-up 10	*Developer and provider of own technology for virtual training.*	Commercial Director
Start-up 11	*Manufacturer and provider of spatial imaging camera solutions.*	Founder and Board Director

The selection process resulted in a final sample of 2 innovation intermediaries, 5 corporates, 11 start-ups, and a total of 22 informants. Incumbent A and Start-ups 1–7 are associated with Alpha Intermediary, while Incumbent B-E and Start-ups 8–11 are associated with Beta Intermediary. Table 1 describes the participant organisations, the informants interviewed, and the number of interviews.

Various actions were taken to ensure the validity and reliability of the research. Data triangulation was accomplished by sourcing multiple data streams, including interviews, secondary data, and participation in intermediaries' feedback sessions and event launches (Jick 1979). Before each interview, we developed a thorough evaluation of the organisation and its trajectory. This entailed a review of business reports, press releases, and project launches employing empirical triangulation to obtain a clear picture of the context in which informants operated. Internal consistency and adequacy were enhanced through the development of a case study database, including a trail of evidence comprised of raw data, documents, and notes for each case to demonstrate the trustworthiness and foundations of the findings (Darke, Shanks, and Broadbent 1998). The research has been corroborated by the independent and professional view of the four authors, reducing the impact of subjective bias. Rigour was ensured by the presentation of preliminary and final insights to Beta and Alpha ecosystems, respectively, where informants and additional relevant stakeholders validated and complemented the findings confirming how the interpretation of data reflects the reality of the cases. Finally, the phenomena studied can be replicated in similar environments through the analytical generalisation of empirical findings into theory. To do so, external validity was enhanced by explaining the rationale behind the case study selection criteria, a clear contextualisation and description of the cases, and a transparent and rich description of the analysis and patterns identified. These actions aim to empower analytical generalisation of the findings without overlooking the contextual specificities and sample limitations of the current study.

3.4. Data analysis

The analysis of data was developed through an interpretive and iterative process to answer the research question. Informed by the systematic constant comparative method (Glaser and Strauss 2008) and the thematic analysis of qualitative data (Bryman 2016), we followed a 3-step process. Before the first step, we addressed the need to prepare the data for the analysis. At this stage, interviews were transcribed, and an overview analysis of all data collected was undertaken to become familiar with each actor's background and characteristics before beginning the in-depth within-case and cross-case immersion.

The first step consisted of an in-depth analysis of raw data, reading the interview transcripts, and marking the content that was relevant to the research question proposed. First-order categories of codes emerged from the open coding of words and phrases mentioned by the informants (Strauss and Corbin 1990). Table 2 shows an example of illustrative quotes for first-order categories related to the tensions theme, *Divergent digital innovation operations*.

The second step consisted of identifying patterns between the first-order categories in an iterative process that took place within and across cases. Axial coding was used at this stage, continuously comparing the grouped codes across cases (Strauss and Corbin 1990).

Table 2. Divergent digital innovation operations theme: first-order categories and illustrative quotes.

Aggregate Dimension: Tensions in start-up & incumbent digital co-creation
Second-order Theme: Divergent digital innovation operations

- **First-order Category**: Conflicting innovation approaches (agile vs waterfall)

  "Our R&D department is flooded with pressures around executing all those wishes. [. . .] we are working with our CTO department to raise the problem to a structure discussion. It's very difficult when you discuss a case. Should you update that product, or should we do that pilot? It's really a battle where everyone tries to win." Strategic Innovation Director, Incumbent B

  "The challenge is, I think on our side, to keep up with the pace that the small start-up wants to do. [. . .] To reach the level of confidence in the technology that we want to do before we release it, which is product development of course. So far, we have been the slow ones, and the start-up has been the flexible ones." Product Development Director, Incumbent C

  "We are a very traditional production engineering-oriented company with long life cycles. [. . .] It's a challenge for us to work with a start-up that, typically, may be used to really close collaboration, really fast cycle times in iterations, decisions." Strategic Innovation Program Manager, Incumbent B

  "Start-ups by definition are very agile, very entrepreneurial versus [Incumbent], big complex company. In all cases, what we have found is the start-up has a certain expectation in terms of speed, agility of things moving forward. They work at a completely different speed than we do, so of course the perception is, '[Incumbent], you're too slow. You're complicated.'" Digital Ecosystem Manager, Incumbent A

  "The time scales are different. One day you talk about integrating this in their products [. . .] 'Give us a heap of money, we'll start working and we can do it next year.' For them it's like, 'No, no, no, first we'll take this step and then we do this and then. . .' They should field test it literally on the fields and then it will go for another production round [. . .] These things take years." Founder and Board Director, Start-up 11

  "Six months in the start-up world is an eternity. You can fold five companies and start five new ones in that time. [. . .] Companies of that size, even though you are a start-up, they will treat you like you're a company of a major size." CEO and Founder, Start-up 2

  "They think sometimes that they act really quickly, but from a start-up perspective, it's so slow." CEO, Start-up 5

- **First-order Category**: Incumbent inert and rigid digital innovation processes

  "The resources, we have discussed that, that's a problem. We have big things coming in, and we can't source the resources. [. . .] I would say the difficult part is with the R&D organization, because they set down their execution plan, and those engineers are planned every hour." Strategic Innovation Director, Incumbent B

  "That has been a challenge for us because our resource allocation works totally different to what a start-up does. [. . .] a start-up is a way for us to connect with the latest and greatest technology and solutions [. . .] We need to be better in our handling and performance of a start-up collaboration. That work is ongoing." Strategic Innovation Program Manager, Incumbent B

  "It took some time because they were really, really busy with something else in the beginning [. . .] they're quite bound to seasons. Because they do all their tests and stuff. [. . .] Then suddenly in spring they will disappear again because they were so busy testing their machinery out in the field." Founder and Board Director, Start-up 11

  "Can you imagine the development cycle for a [product]? It's not two years, it's not 10 years, it's like 30 years. Well, 15, maybe. It's a really long-life cycle and also development cycle of the product. [. . .] It slows things down. [. . .] When something should be introduced into our systems then according to our organization it's a very rigorous process." Product Development Director, Incumbent C

  "We know what to do and we were really good at what we were doing but for being creative, we need to loosen up those processes and structures. [. . .] How can we maybe try to be more fast than that [. . ..] We need to follow all of the aspects that we have so it's hard to totally be flexible and just leave everything." Innovation and Intrapreneurship Developer, Incumbent E

- **First-order Category**: Misaligned digital innovation scaling goals

  "It can be a really small interaction with [Incumbent] as start-up what they call collaboration, but it's not actually that there's a deal in sight necessarily." CEO and Founder, Start-up 1

  "I think that [Incumbent] was very happy with what we did [. . .] That has been very good, but it didn't give us more than that so to say. [. . .] It didn't kind of gain us more than a method of doing that, more or less." Founder, Start-up 3

  "We wanted to have a partnership, not a sub-contractorship. The contract which came from [Incumbent] was just a consultancy contract. [. . .] We didn't actually use the most advanced technology we have [. . .] We should have some kind of agreement about the long-term licensing model or something similar, so we have a bit of safety or some understanding about the long-term solution." COO and Founder, Start-up 6

  "I think perhaps it was a kind of a naive expectation from the start that we did this project and it would definitely lead to something more. [. . .] They have said that they perhaps will contact us if they are going to keep going with this product. One expectation was that perhaps it will lead to more work with [Incumbent]. Right now, we don't know if it will." Chief Design Officer, Start-up 8

This process led to second-order themes that represent distinctive conceptualisations, such as specific tension groups or mitigation mechanisms. The third step involved further generation of aggregate dimensions leading to a higher level of abstraction. Here, specific phases were identified comprising a process of intermediation. The theoretical framework of the study was used to anchor the dimensions to the literature on digital co-creation and innovation intermediation. Figure 1 shows the resulting data structure.

The last step consisted of identifying connections between first-order category codes, second-order themes, and aggregate dimensions, both at the specific case and at the phenomenon levels. Selective coding was used to identify interrelationships and to articulate the knowledge acquired during the analysis (Creswell and Poth 2013). Continuous revision of secondary data and development of within- and cross-case tables enabled the refining of a coherent story line from the insights that emerged. To ensure rigorousness in the analysis, the authors developed the coding scheme independently. In the event of divergent opinions, consensus was reached through pertinent discussion and subsequent modifications.

The results of the data collection and analysis processes are presented in the findings section of the paper. Within the aggregate dimension of tensions, themes explain the main groups of tensions between start-ups and incumbents that challenge the progression and success of digital co-creation. Concerning the role and impact of innovation intermediaries, aggregate dimensions describe the phases in which main mitigation mechanisms (themes) are deployed by innovation intermediaries. It should be noted that our focus centred on the most influential tensions namely, those that had a major negative effect and were harder to manage by the parties in the digital co-creation process. Indeed, those were the tensions most prevalent in informants' interviews. A detailed theoretical interpretation of the findings and their implications are reported in the concluding section of the paper.

4. Findings

4.1. Tensions in start-up – incumbent digital co-creation

The analysis revealed three main groups of tensions emerging in start-up – incumbent digital co-creation namely, cultural, operational, and technical. Cultural tensions reflect the impact of perceptions, mindsets, and working habits; operational tensions highlight the diversity of approaches, processes, and goals between the parties; while technical tensions focus on incumbents' lower digital competences, digital infrastructure, and digital readiness due to their lack of experience and maturity in dealing with newest digital technologies. We capture these tensions under the themes of incompatible digital co-creation cultures, divergent digital innovation operations, and misaligned technical capabilities.

4.1.1. Incompatible digital co-creation cultures

Culture emerged as a crucial determinant of the success of the parties' digital co-creation. Despite incumbents and start-ups complementarities, the innovativeness associated with their interactions reveals underlying cultural tensions that are difficult
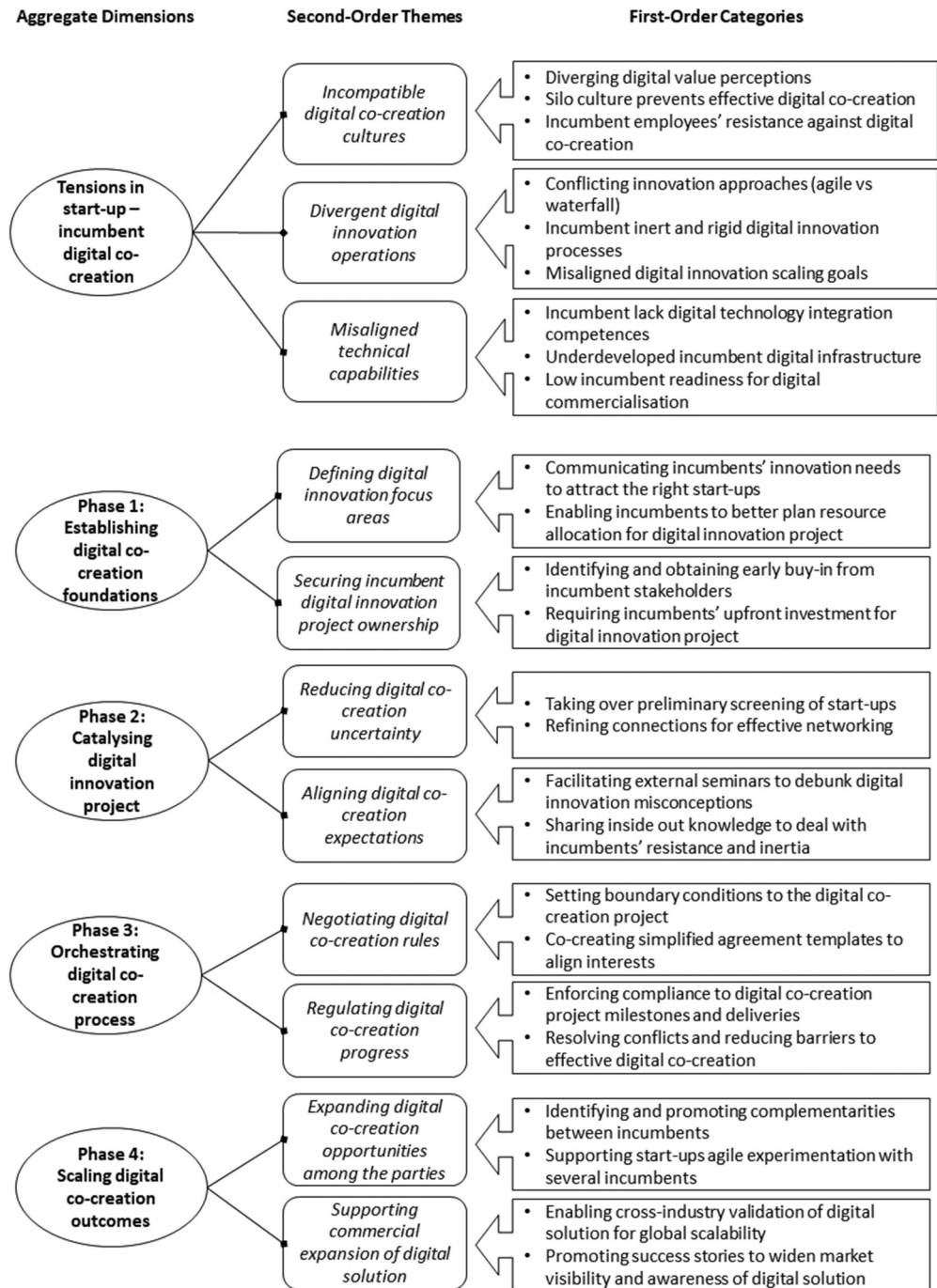
Aggregate Dimensions　　　　**Second-Order Themes**　　　　　　**First-Order Categories**

Tensions in start-up – incumbent digital co-creation

- *Incompatible digital co-creation cultures*
  - Diverging digital value perceptions
  - Silo culture prevents effective digital co-creation
  - Incumbent employees' resistance against digital co-creation

- *Divergent digital innovation operations*
  - Conflicting innovation approaches (agile vs waterfall)
  - Incumbent inert and rigid digital innovation processes
  - Misaligned digital innovation scaling goals

- *Misaligned technical capabilities*
  - Incumbent lack digital technology integration competences
  - Underdeveloped incumbent digital infrastructure
  - Low incumbent readiness for digital commercialisation

Phase 1: Establishing digital co-creation foundations

- *Defining digital innovation focus areas*
  - Communicating incumbents' innovation needs to attract the right start-ups
  - Enabling incumbents to better plan resource allocation for digital innovation project

- *Securing incumbent digital innovation project ownership*
  - Identifying and obtaining early buy-in from incumbent stakeholders
  - Requiring incumbents' upfront investment for digital innovation project

Phase 2: Catalysing digital innovation project

- *Reducing digital co-creation uncertainty*
  - Taking over preliminary screening of start-ups
  - Refining connections for effective networking

- *Aligning digital co-creation expectations*
  - Facilitating external seminars to debunk digital innovation misconceptions
  - Sharing inside out knowledge to deal with incumbents' resistance and inertia

Phase 3: Orchestrating digital co-creation process

- *Negotiating digital co-creation rules*
  - Setting boundary conditions to the digital co-creation project
  - Co-creating simplified agreement templates to align interests

- *Regulating digital co-creation progress*
  - Enforcing compliance to digital co-creation project milestones and deliveries
  - Resolving conflicts and reducing barriers to effective digital co-creation

Phase 4: Scaling digital co-creation outcomes

- *Expanding digital co-creation opportunities among the parties*
  - Identifying and promoting complementarities between incumbents
  - Supporting start-ups agile experimentation with several incumbents

- *Supporting commercial expansion of digital solution*
  - Enabling cross-industry validation of digital solution for global scalability
  - Promoting success stories to widen market visibility and awareness of digital solution

Figure 1. Data structure: aggregate dimensions, second-order themes, and first-order categories.

to manage. Incumbents' traditional product-centric background, where value stems from tangible resources, conflicts with start-ups' digital solutions, where value is of an intangible nature. These diverging digital value perceptions were found to inhibit the parties' ability to align their forces towards a common co-creation goal. Internally, silos predominate in the incumbent organisation, where each business unit works in an independent manner. However, the start-ups' digital solutions are widely applicable, requiring communication and coordination across divisions and departments. For example, the digital ecosystem manager from a sustainable electrification corporate explained how overlaps across business units take place in their interactions with start-ups, scattering their resource deployment rather than effectively combining their digital co-creation efforts:

> Silo mentality. Going back to, we are a matrix geographically, and in terms of these divisions or businesses, sometimes we are talking to the same start-up from two different angles, and because it's all on their NDA and very secret, the left-hand doesn't know what the right one is doing. That's one hurdle. Digital Ecosystem Manager, Incumbent A

In addition, some incumbent employees are reticent to change working habits and attitudes to engage with start-ups. However, digital co-creation requires a more relational and open interaction than traditional supplier-customer relationships. For instance, the head of sales and accounts at an automated customer support start-up explained how it did not manage to deliver a pilot project with a business unit due to cultural tensions, which inhibited the digital transformation required to test the value of its digital solution:

> The reason because we failed, well I wouldn't say fail, but the reason that we didn't succeed all the way with [business unit] [. . .] is also very much differences in how [business unit], how they're working with content, how they work with information. [. . .] In terms of culture, in terms of working with digital transformation as a project, that differs a lot. [. . .] That gap is very much related to the culture and how they work with digital content. The culture, how willing they are of letting go of old habits. Head of Sales and Accounts, Start-up 4

4.1.2. Divergent digital innovation operations

Operationally, the parties' innovation approaches create tensions when the agility characteristic of start-ups meets with the waterfall approach of incumbents. For instance, the founder and board director of a spatial imaging solutions start-up explained how this situation places a toll on progression in the digital co-creation process. Its willingness to quickly move forward was constantly constrained by the series of steps that the incumbent had to follow to implement and commercialise innovations:

> The time scales are different. One day you talk about integrating this in their products [. . .] 'Give us a heap of money, we'll start working and we can do it next year.' For them it's like, 'No, no, no, first we'll take this step and then we do this and then . . . .' They should field test it literally on the fields and then it will go for another production round [. . .] These things take years. Founder and Board Director, Start-up 11

In addition, the digital nature of start-ups' solutions aggravate this operational gap between the parties. The product development director of a farming machinery corporate recognised how a slow pace was required to manage the uncertainty associated with the new technology:

> The challenge is, I think on our side, to keep up with the pace that the small start-up wants to do. [...] To reach the level of confidence in the technology that we want to do before we release it, which is product development of course. So far, we have been the slow ones, and the start-up has been the flexible ones. Product Development Director, Incumbent C

In line with their agile innovation approach, start-ups' needs vary throughout the digital co-creation with incumbents, requiring flexibility in securing access to specific resources, such as testing facilities and engineers. However, they are usually faced with inert and rigid digital innovation processes, which can compromise the validation of the digital solution. The strategic innovation director from an industrial handling vehicles corporation referred to this tension and the difficulties of meeting start-ups' needs:

> The resources, we have discussed that, that's a problem. We have big things coming in, and we can't source the resources. [...] I would say the difficult part is with the R&D organization, because they set down their execution plan, and those engineers are planned every hour. Strategic Innovation Director, Incumbent B

Lastly, misaligned digital innovation scaling goals were found to reduce start-ups' degree of satisfaction with the digital co-creation efforts. Incumbents were often open to explore a particular technology or application without having a defined plan to further implement or commercialise it. Start-ups, on the other hand, were seen to look after securing the scale-up through further contractual agreements with the incumbent. Upon realising, start-ups become more protective of their solution, which reduces the potential digital value co-creation between the parties. The COO and founder of a data analytics start-up explained the disconformity with the contractual agreement and how it was decided not to use some of their most advanced technology to safeguard the start-up's value:

> We wanted to have a partnership, not a sub-contractorship. The contract which came from [Incumbent] was just a consultancy contract. [...] We didn't actually use the most advanced technology we have [...] We should have some kind of agreement about the long-term licensing model or something similar, so we have a bit of safety or some understanding about the long-term solution. COO and Founder, Start-up 6

4.1.3. Misaligned technical capabilities

The different technical capabilities of start-ups and incumbents comprise the last set of tensions identified. First, incumbents' ability to integrate start-ups' digital solutions is contingent on their maturity level and degree of experience with specific technologies. In addition, digital security issues arise due to the confrontation between traditional and innovative systems. Underdeveloped digital infrastructures emerge as a key aspect constraining digital co-creation, where data sharing and configuration (i.e. standardisation) may not be appropriate for the needs of the start-up. For instance, the CEO and founder of an energy tracking start-up explained the impact that incumbent's underdeveloped facilities had for the validation of its solution:

> Then, we have the other end of the spectrum where we have [Incumbent] facilities that are not even connected to the internet. The best we could have done at those facilities would have been to send out a physical technician to read their meter readings and type it down on a paper and send it to us. [...] That's a distance in, let's call it, digital maturity or innovation adoption. CEO and Founder, Start-up 2

Concluding, an important aspect to be able to scale digital co-creation into a marketable solution is the readiness for digital commercialisation. While incumbents are used to implement and commercialise products, there is a lack of technical knowledge, which limits their ability to effectively communicate the benefits of digital solutions. Such limitations can be observed in the loose understanding of digital value by both the internal organisation and their customers. For instance, the digital ecosystem manager from a sustainable electrification corporate explained how digital transformation is not yet widely spread, challenging the cost-effective commercialisation of digitally driven solutions beyond early adopters:

> When we look at our customers, we're still crossing that chasm, that bridge now between early adopters to mass adoption. [. . .] They're actually only starting to understand what this whole digital transformation is about [. . .] when it comes to realizing the value of all of these new technologies and solution. [. . .] That is a challenge, let's say, in a way to educate our customers. Digital Ecosystem Manager, Incumbent A

4.2. A process for innovation intermediation in start-up – incumbent digital co-creation

The analysis of innovation intermediaries highlighted their understanding of both start-ups' and incumbents' needs as well as of the main tensions arising throughout their digital co-creation. Accordingly, intermediaries were seen to devote significant efforts to the mitigation of such tensions through the planning and implementing of diverse mechanisms throughout the digital co-creation process. Our findings detail the role and impact of innovation intermediaries in a four-phase intermediation process framework: 1) *establishing digital co-creation foundations*, 2) *catalysing digital innovation project*, 3) *orchestrating digital co-creation process*, and 4) *scaling digital co-creation outcomes*. The analysis revealed how, in each phase, innovation intermediaries assess and evaluate emerging tensions to adequately deploy the appropriate mitigation mechanism, enabling start-ups and incumbents to reach specific digital co-creation milestones. In other words, intermediation becomes crucial for the successful progression in start-up – incumbent digital co-creation. Figure 2 depicts a process framework for intermediation in innovative and technology driven co-creation contexts.

4.2.1. Phase 1: establishing digital co-creation foundations

Phase 1 takes place before start-ups and incumbents interact or, in other words, before both parties meet for the first time. The role of innovation intermediaries in this phase is to establish the foundations for an effective digital co-creation. Their prior understanding and relationship with incumbents provide intermediaries with an advantageous position to provide early support and create the right ecosystem for a successful co-creation. Thus, the impact of Phase 1 can be observed in a retroactive manner, where such early foundations mitigate and even prevent tensions from emerging throughout start-up – incumbent digital co-creation. Our analysis identified two key mitigation mechanisms deployed in this phase: *defining digital innovation focus areas* and *securing incumbent digital innovation project ownership*.

First, intermediaries help define the innovation areas that will be the focus of the parties' digital innovation project. Here, intermediaries assess and identify the digital innovation needs of incumbents and together prioritise and group them into specific focus areas. In doing so, intermediaries improve alignment between incumbents' problems and start-ups' solutions. For instance, communicating the digital innovation focus areas allows to attract start-ups with a matching applied technology into the innovation intermediary's ecosystem. The CEO from Beta Intermediary highlighted the relevance of sharing a comprehensive definition of digital innovation focus areas with start-ups:

> This year, we have put a lot more time spent to discuss the different areas, [. . .] to describe what are the challenges in each area, and what other partner companies looking for when it comes to partnering with start-ups. I think we have a better communication material to attract and hopefully get more start-ups to apply for this year. CEO, Beta Intermediary

This mechanism also provides a starting point for incumbents to better plan resource allocation for the upcoming digital innovation project. For instance, the technology and innovation manager from a safety and security incumbent explained how knowing about focus areas and start-ups in advance allowed to pre-select the relevant people in the organisation to be involved:

> When the [digital co-creation] process starts, we know which [start-ups] have applied. From before we will start, we know which the focus areas are, so we know which people in the organization are relevant. Technology and Innovation Manager, Incumbent D

Second, intermediaries take on the task of securing incumbents' ownership of the upcoming digital innovation project. To do so, intermediaries rely on their close relationship with incumbents to identify and obtain early buy-in from key stakeholders. In addition, intermediaries require an upfront investment from incumbents, mitigating the financial imbalance and providing a safer bet for start-ups. Beta intermediary CEO, for instance, underlined how such a mechanism represents a deciding factor for start-ups to devote their capacity to the digital innovation project:
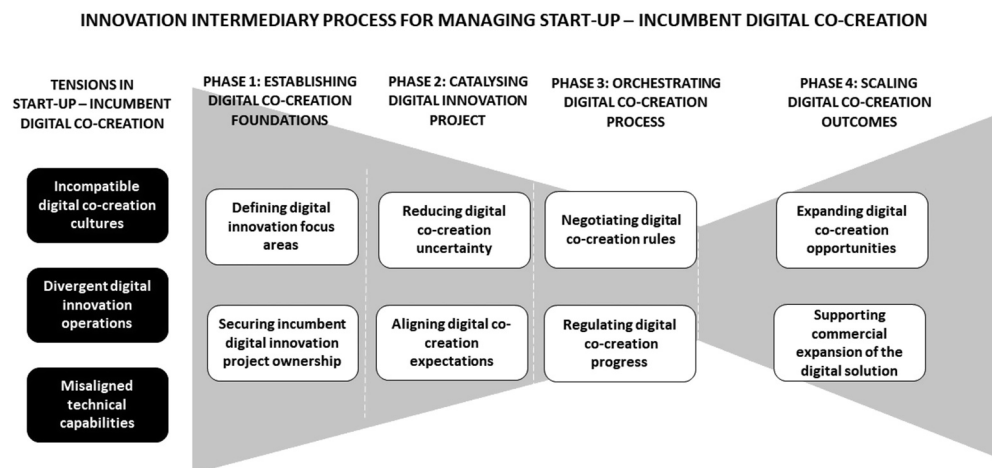

Figure 2. A process framework for intermediation in innovative co-creation contexts.

> The most important is that they were funded by the company. [...] Some of them say like, 'We would not have entered this project if it hadn't been that there was an actual customer business deal in the end.' I think that was also a value, to know that this process might lead to an actual business deal CEO, Beta Intermediary

The chief design officer from a robotics start-up confirmed the impact that such mitigation had over its own commitment to the co-creation:

> They require this commitment from the companies that they have to invest money. [...] Then you know when you participate in this, then you're much more willing to put in a real effort. Chief Design Officer, Start-up 8

4.2.2. Phase 2: catalysing digital innovation project

Phase 2 occurs during the initial interactions when start-ups and incumbents discuss and evaluate the different opportunities for digital co-creation. The role of innovation intermediaries in this phase is to catalyse the digital innovation project. The intermediary leverages both its ecosystem relationships and external networks to support the alignment of the parties to reach and execute an initial agreement. Our analysis identified two key mitigation mechanisms deployed in this phase: *reducing digital co-creation uncertainty* and *aligning digital co-creation expectations*.

First, intermediaries are seen to reduce the uncertainty associated with the novelty of the digital solution. To do so, intermediaries perform a preliminary screening of start-ups ensuring due diligence to allow incumbents to focus on the digital solution rather than on the start-up's credentials or legal compliance. For example, the digital ecosystem manager from a sustainable electrification corporate explained how the onboarding of start-ups from the intermediary's ecosystem was deemed safer and faster than start-ups whose credentials were not reviewed in advance:

> When we work with [Innovation Intermediary], we see that the whole process phase is much faster. Why? Because by being members of [Innovation Intermediary], they have already cleared these legal or integrity due diligence. [...] You can sign any agreement, we don't need to pass through that initial screening. That's already ticked. Digital Ecosystem Manager, Incumbent A

Moreover, intermediaries contribute to the effective networking between the parties, refining connections to ensure that start-ups' digital solutions reach the adequate problem owner in the incumbent organisation. For instance, the founder of a cloud-based sustainability system start-up highlighted the impact of the intermediary in reducing the barriers to connect with the specific person that could discuss the value of their innovative solution:

> Even if the connection I have is not the right one, they have put me in contact with other people. That's something good with [Innovation Intermediary], [...] they are very keen on knowing what they can do. They really want to know if there is anyone else that they can open a door for us. In our field, in our area, it's not a huge amount of people that we can meet. Founder, Start-up 3

Second, intermediaries facilitate the alignment of expectations between the parties, easing their interactions and reducing potential complexity in the long run. To do so,

intermediaries enable incumbents and start-ups to achieve a common digital co-creation vision. For instance, intermediaries rely on a network of external actors to run seminars on various digital innovation topics, helping to debunk digital innovation misconceptions. In particular, Alpha Intermediary was praised by start-ups for the quality of seminars delivered by reputed companies with global presence. Similarly, intermediaries share inside-out knowledge based on the experiences and relationships built in their ecosystems, helping to deal with digital innovation resistance and inertia. The head of sales and accounts at an automated customer support start-up highlighted the support of the innovation intermediary in overcoming the incumbent's digital co-creation misalignments based on key inside knowledge:

> [Innovation Intermediary helped us] to remove all possible friction, but also give us the type of tips we need. For example, we can say, 'Look, [Incumbent] is never going to give in on these terms. So, how can you come around it?' That's the type of recommendations or the type of information they will give me. Head of Sales and Accounts, Start-up 4

4.2.3. Phase 3: orchestrating digital co-creation process

Phase 3 takes place through the parties' digital co-creation, when start-ups and incumbents interact to achieve the specific goals of their agreed project. The role of innovation intermediaries in this phase is to orchestrate the digital co-creation process. The intermediary relies on its legitimacy as a reputed and trusted third party to mediate between the parties and establish an effective governance of the process. Our analysis identified two key mitigation mechanisms deployed in this phase: *negotiating digital co-creation rules* and *regulating digital co-creation progress*.

First, intermediaries negotiate, for the mutual benefit of the parties, the digital co-creation rules that will lead the way into the novel digital co-creation process. To do so, intermediaries design and provide a set of boundary conditions to guide start-ups and incumbents in their interactions, creating a common digital innovation route plan for an effective co-creation. While Alpha exercised a looser approach to boundary setting, Beta was seen to provide stepwise guidance to the co-creation process. Nevertheless, informants described how the presence of intermediaries' rules reduced the complexity associated with the lack of prior experience in digital co-creation, allowing to focus on the goals rather than the formalities of the process. For instance, the innovation and intrapreneurship developer from an energy turbines manufacturing corporate highlighted the positive impact of this mechanism in providing a clear structure for the co-creation process:

> I think what's really positive with it is that it provides a structure for this work. We get help with the structure, a plan. Everything is well organized. Innovation and Intrapreneurship Developer, Incumbent E

In addition to the structure, intermediaries were seen to reduce complexity by co-creating simplified agreement templates that could meet the need of start-ups for agility while complying with incumbents' rigid procedures. In the words of the head of business development at one of the intermediary ecosystems, there is continuous improvement in global framework agreements where they take on the negotiation of lead times in digital

innovation projects to achieve the best possible conditions for both incumbents and start-ups:

> I'll give you an example, that in [country] if we have a frame agreement, they have global updates and this kind of framework set up to make everything easier for the start-ups. [...] They waited seven months to get the project order, [...] They called us [...] Then we restarted everything and [...] we give them a global frame agreement. It took three weeks. We are improving these processes. Head of Business Development, Alpha Intermediary

Second, intermediaries deploy mechanisms to regulate the digital co-creation progress between the parties. To do so, intermediaries take on the role of enforcing compliance with the established rules, monitoring and pushing the parties to achieve the digital innovation project milestones and deliveries. The COO and founder of a data analytics start-up explained how such a mechanism was key for the ongoing compliance of the parties:

> The engagement around the [digital innovation project] and getting going the project and seeing that the contract is actually something that's happening, there he was really pushy, that's true. [...] He was both pushing us and [incumbent] side actually. COO and Founder, Start-up 6

In parallel, intermediaries were seen to resolve any conflicts of interest that may arise during the project and to reduce any emerging barriers so that momentum is maintained throughout the process. As pointed out by the CEO of an innovation intermediary, this is an underestimated mechanism whose impact goes beyond aligning interests into effectively executing the digital co-creation:

> I feel like I'm the mother sometimes. Have you read this? Have you been distributing it since the writeup? [...] we are continuously following up [...], looking for challenges and trying to support if there's something that isn't working to see how can we make it better. I think that's an important role that might be underestimated in this kind of processes [...] to make sure that all the processes are moving in the right direction. CEO, Beta Intermediary

4.2.4. *Phase 4: scaling digital co-creation outcomes*

Phase 4 comprises the aftermath of the digital innovation project, when start-ups and incumbents achieve specific outcomes as a result of their co-creation efforts (e.g. a proof of concept, a validated digital service). The role of innovation intermediaries in this phase is to support the scaling of the resulting outcomes. The mechanisms deployed are seen to facilitate the parties' digital outcomes expansion in the intermediaries' ecosystem and, internationally, in global markets. Thus, the impact of Phase 4 can be witnessed in a prospective manner, where the intermediary paves the way towards the successful commercialisation and implementation of digital solutions. Our analysis identified two key mitigation mechanisms deployed in this phase: *expanding the digital co-creation opportunities among the parties* and *supporting the commercial expansion of the digital solution*.

First, intermediaries help expand the opportunities for digital co-creation within their ecosystems. To do so, intermediaries identify and promote the exploitation of complementarities among partner incumbents, allowing for digitally driven ways of working to cascade from more advanced to traditional incumbents. In doing so, intermediaries

reduce dependence on product-centric innovation approaches and unveil future avenues for digital co-creation. For instance, the technology and innovation manager from a safety and security incumbent highlighted the benefits of synergies and learning opportunities provided by the Intermediary:

> What is good is that we are not one company, we are four. We are actually learning from each other. It's interesting to see how [Incumbent] is doing things and their really good planning, I think we can learn a lot from them. Technology and Innovation Manager, Incumbent D

Intermediaries also enable start-ups' agile experimentation with several incumbents, increasing the opportunities to maximise the value of the digital solution while reducing the time to market. While Beta is shown to have a permanent pool of incumbent partners, Alpha is currently opening its portfolio of partners to ensure that the maximum value co-creation potential is realised through its intermediation. This evolution demonstrates the importance of intermediaries' ability to engage their ecosystems. The founder of a digital intelligence engineering start-up explained how agile testing with two incumbents enabled a dual plan for the implementation of the digital solution:

> Our first goal, this project that we have was to see if it's valuable or not. If it's doable or not. [...] We were looking at [...] similarities and differences between these two organizations and say, if we have this organization, we should do like this and we have this organization we should do like this. [Now] we have a clear path for two companies and how to proceed. We know exactly how to get started implementing it. Founder, Start-up 9

Second, intermediaries support international commercialisation of the parties' validated digital solutions into global markets. To do so, intermediaries enable the cross-industry validation of digital solutions, allowing the outcomes of digital co-creation to better fit the requirements of global scalability. The product development director of a farming machinery incumbent explained how the resulting proof of concept of a joint cross-industry validation had a bigger commercial value, which otherwise would have remained uncovered:

> With the collaboration with [Incumbent], you could get more views on the challenge or the solution that you have ahead of you [...] That made the whole proof of concept bigger and more successful than if I were to finance it only from [our] side. Product Development Director, Incumbent C

In addition, intermediaries were identified as having a crucial role in widening market visibility and awareness of the validated digital solutions through the promotion of incumbents' and start-ups' success stories. For instance, the commercial director from a digital training start-up remarked on the positive role of the Intermediary in marketing the digital co-creation outcomes:

> I think the follow-up for them, and sharing with the public what was the outcome, I think that was a good thing. Doing the PR marketing and sharing, I think they handled that very good. Commercial Director, Start-up 10

5. Conclusion

5.1. Theoretical contributions

The present study tapped into the need to adopt an overarching perspective to explore the success and failure of start-up – incumbent digital co-creation, focusing on the intermediation of an independent third party. Accordingly, we contribute to the dialogue on the relevance of innovation intermediaries for the success of start-up – incumbent digital innovation projects. In doing so, this study makes three theoretical contributions.

First, we contribute to the literature by *defining the unique tensions in digital co-creation between start-ups and incumbents*. While the prior literature has extensively discussed co-creation between large and small firms (e.g. Galati et al. 2021; Ritala et al. 2017), our findings detail the specificities associated with the uniqueness of start-up – incumbent digital innovation projects identifying the emergence of three main groups of tensions namely, cultural, operational, and technical. Accordingly, we advance the growing streams of research investigating incumbents' digital transformation and the literature on co-creation. In addition, from a methodological standpoint, prior studies tend to focus on the views and experiences of one party (Steiber, Alänge, and Corvello 2020; Kurpjuweit, Wagner, and Choi 2021), which can lead to an unbalanced representation of the co-creation process and its outcomes. Our study captures both sides of digital co-creation, promoting a more nuanced description of inherent tensions since each party's reflections are built on differing expectations. For instance, we drew attention to the incompatibility of digital co-creation cultures based on start-up and incumbent experiences, highlighting the dual character of the underlying tension. Thus, our study supports the efforts of scholars who have taken a deeper look into the views of one single actor, complementing such contributions through a multi-actor perspective.

Second, we contribute by *illustrating the importance of innovation intermediaries in managing start-up – incumbent digital co-creation*. While the literature on innovation intermediaries has studied a variety of innovation settings (e.g. sustainability transitions by Kivimaa (2014) and innovation development in emerging markets by Stewart and Hyysalo (2008)), we position this study within the digital co-creation context. We argue that, due to the vast disparity in competencies, innovation intermediaries will play an increasingly important role in supporting the co-creation of digital innovation outcomes. Indeed, given that incumbents need to implement and commercialise the latest trends in digital technologies (Sjödin, Parida, and Visnjic 2022), collaborating with start-ups will command an even more critical part in the future route maps of many industries. Thus, start-up – incumbent digital co-creation has allowed us to move away from prior studied intermediation settings to look closely at the experiences of specific parties who are pioneering this type of innovative process and expand the literature on innovation intermediation in a complex and contemporary context.

Finally, our key contribution is *conceptualising a process on how innovation intermediaries support and enable start up – incumbent digital co-creation*. Accordingly, we detail how innovation intermediaries design and implement specific mechanisms to alleviate tensions throughout the parties' digital co-creation. This study offers a holistic process framework covering early pre-engagement, initial digital innovation project, and later follow-up. Specifically, we detail four overall phases: 1) establishing digital co-

creation foundations, 2) catalysing digital innovation project, 3) orchestrating digital co-creation process, and 4) scaling digital co-creation outcomes. Each phase involves specific mechanisms and actions designed to mitigate the emergence of tensions and their negative impact. In turn, we observed how innovation intermediaries aim for constant awareness of both parties' perspectives to be able to deploy adequate mitigation to maximise their degree of satisfaction according to their changing needs. Accordingly, our process framework illustrates the interim learning and the evolution of innovation intermediation over time. Thus, this study expands current knowledge clarifying the critical role of intermediation, not only during early interactions (De Groote and Backmann 2020; Kurpjuweit, Wagner, and Choi 2021) but also throughout the parties' digital co-creation, where underlying hard-to-manage tensions become apparent. We contend that, whereas intermediaries are known to enable the engagement between start-ups and incumbents (Gaim, Nair, and Blomquist 2020; Kohler 2016), ongoing monitoring, support, and governance over the entire digital co-creation process is the key that the parties require in order to achieve long-term success.

5.2. Managerial implications

The present study carries important implications for both start-ups' and incumbents' managers engaged in digital co-creation, as well as for innovation intermediaries mediating the process.

First, the findings outlined here suggest that start-ups need to explicitly communicate their needs in terms of digital capabilities, data access, and organisational infrastructure required to validate the digital solution with the incumbent. We believe that a way to effectively exploit the opportunities of digital co-creation is to secure the essential requirements to demonstrate the value of the digital solution. Thus, early communication of such requirements from the start-up can enable the incumbent to remove the barriers within its organisation to access, leverage, and deploy the right people, resources, and installations across the various business units.

Second, our data suggests that the best way for incumbents to reduce the likelihood of emerging tensions in their digital co-creation with start-ups is to build an internal digital innovation culture. We recommend that incumbents create and share positive stories about digital innovation projects with start-ups within their organisations and, particularly, in those business units where resistance to change and innovation predominates. By communicating the success of digital outcomes from the co-creation, incumbents can steadily converge towards an open culture where start-ups are welcomed and encouraged to join forces with employees from different roles and backgrounds. A positive outlook like this can help increase understanding and acceptance of the intangible value of digital innovation, boosting the implementation and commercialisation of co-created digital solutions.

Lastly, we emphasise the need for innovation intermediaries to be active across the four identified phases to successfully manage start-up – incumbent digital co-creation. This study clearly shows how intermediaries are a critical factor for the achievement of digital co-creation goals, whose management and support enables both parties to maximise benefits. We advise innovation intermediaries to use the process framework as a guide to develop internal routines and processes targeted at specific phases, while

considering the evolution of the parties' needs to adapt the deployment of mechanisms thorough start-up – incumbent interactions.

5.3. Limitations and future research

The present study is based on two in-depth case studies featuring two innovation intermediaries and its associated start-ups and incumbents. While the insights revealed in this research address the co-creation of specific digital innovation projects, we believe that these findings are still relevant in mitigating tensions in other innovative contexts in the domain of co-creation processes.

Even though our conclusions are generalisable to contexts characterised by similar conditions, we call for future research to expand our boundary conditions and explore other types of industries or markets. For instance, co-creation processes in the healthcare industry could take place between multiple parties, such as end users and other relevant stakeholders, increasing the complexity and risk of failure (Martínez-Caro et al. 2018; Massaro 2021). Exploring intermediation in such contexts offers several opportunities to augment this study's contributions. Furthermore, we encourage researchers to adopt a global perspective and investigate how market conditions (i.e. regulations and policies) affect the mediation and management of innovation intermediaries.

We acknowledge that the process framework has the potential to improve on the basis of the iterations and the lessons learnt by the intermediaries from their participation in diverse digital innovation projects. Adopting a longitudinal perspective to intermediation could lead to interesting findings on the long-term dynamics of support, providing the literature with a comprehensive view on the evolution of tensions and the mitigation mechanisms in start-up – incumbent digital co-creation. In addition, a longitudinal study has the potential to shed light on the learning behaviour of the parties, uncovering diverse pathways to improve intermediation over time.

To conclude, we have not considered how the specific digital technology could affect the emergence of tensions between the parties. For instance, validating an early-stage AI-based digital solution would require a higher degree of testing than an easy-to-configure-and-adapt application. Future research could explore that matter and other contingencies to understand its effect on emerging tensions and, in turn, on the intermediary's support. This would help strengthen the evidence on whether the specific digital technology acts as a barrier to tension mitigation in digital co-creation.

Disclosure statement

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References

Baloutsos, S., A. Karagiannaki, and K. Pramatari. 2022. "Identifying Contradictions in an Incumbent–Startup Ecosystem–An Activity Theory Approach." *European Journal of Innovation Management* 25 (6): 527–548. doi:10.1108/EJIM-04-2020-0114.

Barrett, G., and G. Tsekouras. 2022. "A Tango with a Gorilla: An Exploration of the Microfoundations of Open Innovation Partnerships Between Young Innovative Companies and Multi-National Enterprises." *Technovation* 117 (1): 102561. doi:10.1016/j.technovation.2022.102561.

Barrie, J., G. Zawdie, and E. João. 2017. "Leveraging Triple Helix and System Intermediaries to Enhance Effectiveness of Protected Spaces and Strategic Niche Management for Transitioning to Circular Economy." *International Journal of Technology Management & Sustainable Development* 16 (1): 25–47. doi:10.1386/tmsd.16.1.25_1.

Bessant, J., and H. Rush. 1995. "Building Bridges for Innovation: The Role of Consultants in Technology Transfer." *Research Policy* 24 (1): 97–114. doi:10.1016/0048-7333(93)00751-E.

Björkdahl, J. 2020. "Strategies for Digitalization in Manufacturing Firms." *California Management Review* 62 (4): 17–36. doi:10.1177/0008125620920349.

Blanka, C., and V. Traunmüller. 2020. "Blind Date? Intermediaries as Matchmakers on the Way to Start-Up—industry Coopetition." *Industrial Marketing Management* 90: 1–13. doi:10.1016/j.indmarman.2020.05.031.

Bryman, A. 2016. *Social Research Methods*. Oxford: Oxford University Press.

Burton, J., V. Story, J. Zolkiewski, C. Raddats, T. S. Baines, and D. Medway. 2016. "Identifying Tensions in the Servitized Value Chain: If Servitization is to Be Successful, Servitizing Firms Must Address the Tensions the Process Creates in Their Value Network." *Research-Technology Management* 59 (5): 38–47. doi:10.1080/08956308.2016.1208042.

Carayannopoulos, S. 2009. "How Technology–Based New Firms Leverage Newness and Smallness to Commercialize Disruptive Technologies." *Entrepreneurship Theory & Practice* 33 (2): 419–438. doi:10.1111/j.1540-6520.2009.00297.x.

Chandler, J. D., and S. L. Vargo. 2011. "Contextualization and Value-In-Context: How Context Frames Exchange." *Marketing Theory* 11 (1): 35–49. doi:10.1177/1470593110393713.

Corvello, V., A. Steiber, and S. Alänge. 2021. "Antecedents, Processes and Outcomes of Collaboration Between Corporates and Start-Ups." *Review of Managerial Science* 1–26. doi:10.1007/s11846-021-00510-8.

Creswell, J. W., and C. N. Poth. 2013. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: SAGE Publications.

Czakon, W., and K. Czernek. 2016. "The Role of Trust-Building Mechanisms in Entering into Network Coopetition: The Case of Tourism Networks in Poland." *Industrial Marketing Management* 57: 64–74. doi:10.1016/j.indmarman.2016.05.010.

Darke, P. G., G. Shanks, and M. Broadbent. 1998. "Successfully Completing Case Study Research: Combining Rigour, Relevance and Pragmatism." *Information Systems Journal* 8 (4): 273–289. doi:10.1046/j.1365-2575.1998.00040.x.

De Groote, J. K., and J. Backmann. 2020. "Initiating Open Innovation Collaborations Between Incumbents and Startups: How Can David and Goliath Get Along?" *International Journal of Innovation Management* 24 (2): 2050011. doi:10.1142/S1363919620500115.

Edmondson, A. C., and S. E. McManus. 2007. "Methodological Fit in Management Field Research." *Academy of Management Review* 32 (4): 1246–1264. doi:10.5465/amr.2007.26586086.

Eisenhardt, K. M. 1989. "Building Theories from Case Study Research." *Academy of Management Review* 14 (4): 532–550. doi:10.2307/258557.

Eisenhardt, K. M., and M. E. Graebner. 2007. "Theory Building from Cases: Opportunities and Challenges." *Academy of Management Journal* 50 (1): 25–32. doi:10.5465/amj.2007.24160888.

Gaim, M., S. Nair, and T. Blomquist. 2020. "Orchestrating Ecosystems: Interactive Spaces for Startup-Corporate Collaboration." *Management of Innovation and Technology* 3: 8–9.

Galati, F., B. Bigliardi, R. Galati, and G. Petroni. 2021. "Managing Structural Inter-Organizational Tensions in Complex Product Systems Projects: Lessons from the Metis Case." *Journal of Business Research* 129: 723–735. doi:10.1016/j.jbusres.2019.10.044.

Gephart, R. P., Jr, and S. Rynes. 2004. "Qualitative Research and the Academy of Management Journal." *Academy of Management Journal* 47 (4): 454–462. doi:10.5465/amj.2004.14438580.

Glaser, B. G., and A. L. Strauss. 2008. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New Brunswick and London: Aldine Transaction.

Grönroos, C., and P. Voima. 2013. "Critical Service Logic: Making Sense of Value Creation and Co-Creation." *Journal of the Academy of Marketing Science* 41: 133–150.

Hansen, M. T., H. W. Chesbrough, N. Nohria, and D. N. Sull. 2000. "Networked Incubators: Hothouses of the New Economy." *Harvard Business Review* 78 (5): 74–84.

Hernández-Chea, R., M. Mahdad, T. T. Minh, and C. N. Hjortsø. 2021. "Moving Beyond Intermediation: How Intermediary Organizations Shape Collaboration Dynamics in Entrepreneurial Ecosystems." *Technovation* 108: 102332. doi:10.1016/j.technovation.2021.102332.

Hogenhuis, B. N., E. A. van den Hende, and E. J. Hultink. 2016. "When Should Large Firms Collaborate with Young Ventures? Understanding Young firms' Strengths Can Help Firms Make the Right Decisions Around Asymmetric Collaborations." *Research-Technology Management* 59 (1): 39–47. doi:10.1080/08956308.2016.1117329.

Howells, J. 2006. "Intermediation and the Role of Intermediaries in Innovation." *Research Policy* 35 (5): 715–728. doi:10.1016/j.respol.2006.03.005.

Jick, T. D. 1979. "Mixing Qualitative and Quantitative Methods: Triangulation in Action." *Administrative Science Quarterly* 24 (4): 602–611. doi:10.2307/2392366.

Johnson, W. H. 2008. "Roles, Resources and Benefits of Intermediate Organizations Supporting Triple Helix Collaborative R&D: The Case of Precarn." *Technovation* 28 (8): 495–505. doi:10.1016/j.technovation.2008.02.007.

Kamalaldin, A., D. Sjödin, D. Hullova, and V. Parida. 2021. "Configuring Ecosystem Strategies for Digitally Enabled Process Innovation: A Framework for Equipment Suppliers in the Process Industries." *Technovation* 105: 102250. doi:10.1016/j.technovation.2021.102250.

Kant, M., and W. Kanda. 2019. "Innovation Intermediaries: What Does It Take to Survive Over Time?" *Journal of Cleaner Production* 229: 911–930. doi:10.1016/j.jclepro.2019.04.213.

Kivimaa, P. 2014. "Government-Affiliated Intermediary Organisations as Actors in System-Level Transitions." *Research Policy* 43 (8): 1370–1380. doi:10.1016/j.respol.2014.02.007.

Klerkx, L., A. Hall, and C. Leeuwis. 2009. "Strengthening Agricultural Innovation Capacity: Are Innovation Brokers the Answer?" *International Journal of Agricultural Resources, Governance and Ecology* 8 (5–6): 409–438. doi:10.1504/IJARGE.2009.032643.

Klerkx, L., and C. Leeuwis. 2008. "Balancing Multiple Interests: Embedding Innovation Intermediation in the Agricultural Knowledge Infrastructure." *Technovation* 28 (6): 364–378. doi:10.1016/j.technovation.2007.05.005.

Kohler, T. 2016. "Corporate Accelerators: Building Bridges Between Corporations and Startups." *Business Horizons* 59 (3): 347–357. doi:10.1016/j.bushor.2016.01.008.

Kohtamäki, M. R., V. Rabetino, D. Parida, D. Sjödin, and S. Henneberg. 2022. "Managing Digital Servitization Toward Smart Solutions: Framing the Connections Between Technologies, Business Models, and Ecosystems." *Industrial Marketing Management* 105: 253–267. doi:10.1016/j.indmarman.2022.06.010.

Kurpjuweit, S., and S. M. Wagner. 2020. "Startup Supplier Programs: A New Model for Managing Corporate-Startup Partnerships." *California Management Review* 62 (3): 64–85. doi:10.1177/0008125620914995.

Kurpjuweit, S., S. M. Wagner, and T. Y. Choi. 2021. "Selecting Startups as Suppliers: A Typology of Supplier Selection Archetypes." *The Journal of Supply Chain Management* 57 (3): 25–49. doi:10.1111/jscm.12230.

Linde, L. D., V. Sjödin, V. Parida, and H. Gebauer. 2020. "Evaluation of Digital Business Model Opportunities: A Framework for Avoiding Digitalization Traps." *Research-Technology Management* 64 (1): 43–53. doi:10.1080/08956308.2021.1842664.

Linde, L., D. Sjödin, V. Parida, and J. Wincent. 2021. "Dynamic Capabilities for Ecosystem Orchestration a Capability-Based Framework for Smart City Innovation Initiatives." *Technological Forecasting and Social Change* 166: 120614. doi:10.1016/j.techfore.2021.120614.

Martínez-Caro, E., J. G. Cegarra-Navarro, A. García-Pérez, and M. Fait. 2018. "Healthcare Service Evolution Towards the Internet of Things: An End-User Perspective." *Technological Forecasting and Social Change* 136: 268–276. doi:10.1016/j.techfore.2018.03.025.

Martiskainen, M., and P. Kivimaa. 2018. "Creating Innovative Zero Carbon Homes in the United Kingdom—intermediaries and Champions in Building Projects." *Environmental Innovation and Societal Transitions* 26: 15–31. doi:10.1016/j.eist.2017.08.002.

Massaro, M. 2021. "Digital Transformation in the Healthcare Sector Through Blockchain Technology. Insights from Academic Research and Business Developments." *Technovation* 120: 102386. doi:10.1016/j.technovation.2021.102386.

Miles, M. B., and A. M. Huberman. 1994. *Qualitative Data Analysis: An Expanded Sourcebook.* Thousand Oaks, CA: Sage Publications.

Naik, P., A. Schroeder, K. K. Kapoor, A. Z. Bigdeli, and T. Baines. 2020. "Behind the Scenes of Digital Servitization: Actualising IoT-Enabled Affordances." *Industrial Marketing Management* 89: 232–244. doi:10.1016/j.indmarman.2020.03.010.

Nambisan, S., K. Lyytinen, A. Majchrzak, and M. Song. 2017. "Digital Innovation Management: Reinventing Innovation Management Research in a Digital World." *MIS Quarterly* 41 (1): 223–238. doi:10.25300/MISQ/2017/41:1.03.

Paiola, M., F. Schiavone, T. Khvatova, and R. Grandinetti. 2021. "Prior Knowledge, Industry 4.0 and Digital Servitization. An Inductive Framework." *Technological Forecasting and Social Change* 171: 120963. doi:10.1016/j.techfore.2021.120963.

Patton, M. Q. 1999. "Enhancing the Quality and Credibility of Qualitative Analysis." *Health Services Research* 34: 1189–1208.

Payne, A. F. K., K. Storbacka, and P. Frow. 2008. "Managing the Co-Creation of Value." *Journal of the Academy of Marketing Science* 36 (1): 83–96. doi:10.1007/s11747-007-0070-0.

Prahalad, C. K., and V. Ramaswamy. 2004a. *The Future of Competition: Co-Creating Unique Value with Customers.* Brighton, Massachusetts: Harvard Business Press.

Prahalad, C. K., and V. Ramaswamy. 2004b. "Co-Creation Experiences: The Next Practice in Value Creation." *Journal of Interactive Marketing* 18 (3): 5–14. doi:10.1002/dir.20015.

Prashantham, S., and K. Kumar. 2019. "Engaging with Startups: MNC Perspectives." *IIMB Management Review* 31 (4): 407–417. doi:10.1016/j.iimb.2019.01.003.

Ranjan, K. R., and S. Read. 2016. "Value Co-Creation: Concept and Measurement." *Journal of the Academy of Marketing Science* 44 (3): 290–315. doi:10.1007/s11747-014-0397-2.

Ritala, P., E. Huizingh, A. Almpanopoulou, and P. Wijbenga. 2017. "Tensions in R&D Networks: Implications for Knowledge Search and Integration." *Technological Forecasting and Social Change* 120: 311–322. doi:10.1016/j.techfore.2016.12.020.

Sjödin, D., V. Parida, M. Palmié, and J. Wincent. 2021. "How AI Capabilities Enable Business Model Innovation: Scaling AI Through Co-Evolutionary Processes and Feedback Loops." *Journal of Business Research* 134: 574–587. doi:10.1016/j.jbusres.2021.05.009.

Sjödin, D. V., V. Parida, and I. Visnjic. 2022. "How Can Large Manufacturers Digitalize Their Business Models? A Framework for Orchestrating Industrial Ecosystems." *California Management Review* 64 (3): 49–77. doi:10.1177/00081256211059140.

Steiber, A., and S. Alänge. 2021. "Corporate-Startup Collaboration: Effects on Large firms' Business Transformation." *European Journal of Innovation Management* 24 (2): 235–257. doi:10.1108/EJIM-10-2019-0312.

Steiber, A., S. Alänge, and V. Corvello. 2020. "Learning with Startups: An Empirically Grounded Typology." *Learning Organization* 28 (2): 153–166. doi:10.1108/TLO-04-2020-0061.

Stewart, J., and S. Hyysalo. 2008. "Intermediaries, Users and Social Learning in Technological Innovation." *International Journal of Innovation Management* 12 (3): 295–325. doi:10.1142/S1363919608002035.

Strauss, A. L., and J. M. Corbin. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.* Thousand Oaks, CA: SAGE Publications.

Vargo, S. L., P. P. Maglio, and M. A. Akaka. 2008. "On Value and Value Co-Creation: A Service Systems and Service Logic Perspective." *European Management Journal* 26 (3): 145–152. doi:10. 1016/j.emj.2008.04.003.

Weiblen, T., and H. W. Chesbrough. 2015. "Engaging with Startups to Enhance Corporate Innovation." *California Management Review* 57 (2): 66–90. doi:10.1525/cmr.2015.57.2.66.

Yin, R. K. 2013. "Validity and Generalization in Future Case Study Evaluations." *Evaluation* 19 (3): 321–332. doi:10.1177/1356389013497081.

Yin, R. K. 2014. *Case Study Research: Design and Methods*. Thousand Oaks, CA: SAGE Publications.