Strategies for digital entrepreneurship success: the role of digital implementation and dynamic capabilities

Tal Berman  
Johannesburg Business School, University of Johannesburg, Johannesburg, South Africa  
Daniel Schallmo  
Neu-Ulm University of Applied Sciences, Neu-Ulm, Germany, and  
Sascha Kraus  
Faculty of Economics and Management, Free University of Bozen-Bolzano, Bolzano, Italy and  
Department of Business Management, University of Johannesburg, Johannesburg, South Africa

Abstract

Purpose – To augment sales revenue, B2B digital start-ups aim to create and sustain commercial relationships with industry incumbents. However, since these incumbents have traditionally struggled with implementing disruptive digital artifacts, most studies have almost exclusively concentrated on their challenges, leaving the digital start-ups’ side underexplored. Therefore, this study seeks to understand how digital start-ups navigate digital implementation (DI) hardships to ultimately achieve digital entrepreneurship success.

Design/methodology/approach – An abductive explanatory multi-case study of four industries that pose a variety of implementation challenges for B2B digital start-ups (agriculture, insurance, real estate and construction, and healthcare) was conducted using data collected from 40 interviews with Israeli experts and relevant digital data observations.

Findings – This study articulates two main observations. (1) Throughout their journeys, digital start-ups have utilized newly created and/or refined dynamic capabilities (DC) to successfully implement their digital artifacts. Simultaneously, successful DI has enabled digital start-ups to create new DC or sustain and evolve current DC. (2) We provide empirical evidence outlining how digital start-ups using continuous learning have combined causation and effectuation logic throughout their DI journeys.

Originality/value – This study answers a call to explore more explicit digital-related drivers (i.e. DI) for digital entrepreneurship success by studying a highly-ranked country on the Global Entrepreneurship Index (GEI) to achieve this. Moreover, it illustrates how digital start-ups evolve throughout their commercial relationships with industry incumbents, thereby enabling an effective approach for successful DI. Such an approach can be considered very valuable for both practitioners and policymakers. Consequently, it advances digital entrepreneurship as an independent research topic.

Keywords Entrepreneurship, Digital, Strategies, Dynamic capabilities, Digital implementation, Success

Paper type Research paper

1. Introduction

In addition to revamping and transforming entire markets and industries, digital technologies have also democratized entrepreneurship by making new venture creation
significantly easier and more accessible (Tang et al., 2022). This development gave rise to a novel research domain known as digital entrepreneurship, which can be defined as “the pursuit of opportunities based on the use of digital media and other information and communication technologies” (Davidson and Vaast, 2010, p. 2).

Simultaneously, digital technologies have also shaped the concept of entrepreneurial success (Kraus et al., 2018). The notion of success, which is commonly considered as achieving the firm’s objectives (Aguilera et al., 2023), takes on a distinctive role within the realm of B2B digital start-ups. Specifically, these entities are considered disruptive market entrants that create, develop, and commercialize digital artifacts to exploit business opportunities (Dong, 2019). For these start-ups, a consistent and prominent objective revolves around the augmentation of sales revenue, often requiring the establishment and sustainment of commercial relationships with industry incumbents (Lammers et al., 2022; Pugliese et al., 2021).

However, numerous incumbents have demonstrated a lack of competence in adopting the disruptive new digital artifacts introduced by such emerging players (Cozzolino et al., 2021). This has largely been due to contextual and cultural challenges, highlighting the pivotal role of effective DI as a critical factor for digital entrepreneurship success (Berman et al., 2023; Garcia Martin et al., 2023). Although research on the relationships between digital start-ups and incumbents has gained momentum, it continues to lack a theoretical foundation (Giglio et al., 2023). Furthermore, since this research has largely been led by strategic management and/or information systems scholars, the focus has been on the incumbents’ challenges, whereas studies on the evolution required by digital start-ups for successful DI remain scarce (Prashantham and Madhok, 2023; Usman and Vanhaverbeke, 2017).

Therefore, this study aims to accomplish three objectives by focusing on B2B digital start-ups’ roles and development during the DI process. First, we wish to generate a holistic understanding of DI from a digital entrepreneurship perspective. Second, we aim to explain DI as an explicit digital economy-related driver of digital entrepreneurship success. Third, we seek to understand the evolution of digital start-ups in their approach toward successful DI. Consequently, our research questions in this paper are presented as follows:

**RQ1.** How and in what ways can DI drive digital entrepreneurship success in the context of start-up–incumbent relationships?

**RQ2.** When viewed through a digital entrepreneurship perspective, how does DI manifest in practice within the context of start-up–incumbent relationships?

**RQ3.** How and in what ways do digital start-ups evolve during the DI process?

Our study makes three primary contributions. First, it presents an approach for achieving successful DI and elucidates its significance as a salient driver of digital entrepreneurship success. Second, we demonstrate how digital start-ups generate, refine, and evolve distinct DC by effectively implementing their artifacts. Lastly, we offer empirical evidence that highlights the utilization of continuous learning by digital entrepreneurs, who integrate both causation and effectuation logic throughout their DI journeys to achieve success.

Given the considerable failure rate among digital start-ups, understanding the determinants of success is paramount. This study contributes to the burgeoning field of digital entrepreneurship by delving deeper into the drivers that enable these organizations to achieve both subjective and objective goals. As this field of research continues to develop, it involves exploring analogous topics that enrich our comprehension of the associated strategies and tactics that are conducive to favorable outcomes. Thus, to address these gaps in the literature, we propose an approach that digital entrepreneurs can adopt to effectively implement digital artifacts while concurrently elucidating cognitive and behavioral mechanisms that facilitate organizational success.
2. Theoretical background

2.1 Theoretical knowledge

2.1.1 Digital entrepreneurship. Traditionally, entrepreneurs have been able to introduce digital innovation (e.g. eCommerce websites such as Amazon and Alibaba; Felicetti et al., 2023) because they are constantly alert to situations (i.e. entrepreneurial opportunities) in imperfect markets that potentially enable financial gains for themselves and other related relevant stakeholders (Alvarez and Barney, 2007; Amit and Zott, 2012; Shane and Venkataraman, 2000). Consequently, entrepreneurship scholars define them as venture creators, action-takers, and resource deployers in ambiguous environments (Klein, 2008).

Digital technologies are changing entrepreneurship as a practice (Si et al., 2023). They enable the digital transformation of the entire traditional entrepreneurial process and facilitate new entrepreneurial opportunities (Guimarães et al., 2023; Trischler and Li-Ying, 2023). Moreover, digital technologies have democratized new venture creation, prompting many from underrepresented groups to engage in entrepreneurial activities (Aloulou et al., 2023). For example, many entrepreneurs have utilized digital platforms (e.g. Shopify and eBay) to gain massive amounts of exposure for their offers and cost-effectively reach wide populations (Wegner et al., 2023). Overall, digital entrepreneurship is the creation of new digital undertakings by exploiting entrepreneurial opportunities while leveraging the disruptive potential of digital technologies (Fuster et al., 2019).

These realizations have created the potential to promote novel theory-building opportunities for entrepreneurship scholars (Zahra et al., 2023). Consequently, digital entrepreneurship has become an independent research topic that essentially studies digital entrepreneurs creating, growing, and sustaining digital start-ups—organizations that previous research considered to be salient fosters of innovation (Felicetti et al., 2023).

However, since digital entrepreneurship remains a nascent and underexplored research field, many of its pillars require further investigation (Lamine et al., 2023). One such pillar is the successful outcomes of digital entrepreneurial initiatives, especially their drivers and factors (Kraus et al., 2018). Even more so, since the digital economy is a relatively novel construct itself, it is important to discover more explicit digital-related drivers of such success (e.g. smart city infrastructure and initiatives; Richter et al., 2015; Berman et al., 2023).

2.1.2 Digital implementation. At present, digital technologies have become essential assets for almost every firm (Matt et al., 2015; Ramadani et al., 2023). Consequently, DI refers to the ability to effectively put digital technology to work (Leonard-Barton and Kraus, 1985). Implementing useful digital technologies is imperative for the survival of firms because it increases their efficiency and competitiveness; thus, it promotes creating and sustaining a competitive edge (Allataifeh et al., 2021; Galindo-Martin et al., 2023). As a fundamental pillar of Schallmo et al.’s (2022) holistic digitalization theory, DI supports firms in executing their digital strategies and transforming their business models. Nevertheless, to date, moving from theory to practice appears to be quite an intricate challenge that many traditional companies fail to live up to (Ammirato et al., 2018). Much of this challenge is related to the profound organizational changes businesses must go through during the digital transformation process (Martínez-Caro et al., 2020). Overall, many companies are hindered from fulfilling their journey toward digital maturity due to a lack of much-needed relevant capabilities (e.g. agility and adaptability; Ramadani et al., 2023; Leso et al., 2023).

Therefore, as part of open innovation mechanisms, incumbents turn to the external assistance of digital start-ups that they consider digital exemplars (Bonnet and Westerman, 2020; Sá et al., 2023; Spender et al., 2017). To extend the holistic digitalization theory to the context of digital entrepreneurship, we define DI as how digital start-ups align their digital artifacts with the existing digital strategies of incumbents to enhance the digital transformation of business models for the latter (see Figure 1 for illustration).
However, while digital start-ups carry the disruptive potential to transform entire industries, cultural and contextual differences with incumbents often disturb their efforts (Garcia Martin et al., 2023). Consequently, DI has become a driver of digital entrepreneurship success (Berman et al., 2023). Nonetheless, due to the lack of knowledge on how to successfully conduct DI, existing research has largely concentrated on the incumbents’ relevant internal challenges, thereby leaving the digital start-ups underexplored (Giglio et al., 2023; Prashantham and Madhok, 2023).

2.2 Theoretical foundations

2.2.1 Bridging demotivational factors for successful digital implementation. Entrepreneurship research has lagged behind practice (Zaheer et al., 2019a, b). This realization offers an intricate scholarly challenge on one hand while requiring entrepreneurship researchers to utilize a practice approach on the other (Champenois et al., 2020). One such lens, known as technology-in-practice, can potentially promote digital entrepreneurship researchers’ investigations of underexplored real-life phenomena such as DI (Morgan-Thomas, 2016). Essentially, this approach primarily concentrates on the real-time and actual use of the technology and is defined as “sets of rules and resources that are (re)constituted in people’s recurrent engagement with the technologies at hand” (Orlikowski, 2000, p. 407).

A key component of successful DI is recurrent engagement, which is the sustainable use of a digital artifact by customers and/or users (MacVaug and Schiavone, 2010). Therefore, digital artifacts must bridge the demotivational gap to become fully integrated into the digital strategy (Borges et al., 2021). Rogers’s (2003) innovation diffusion theory (specifically the perceived attributes of innovation) is a tool used in information systems (e.g. Lin et al., 2021), operations management (e.g. Wamba et al., 2019), marketing (e.g. Shaw et al., 2022), and other disciplines to explain why certain functionalities prevent industry actors from implementing digital artifacts (Wang et al., 2021). Therefore, we found it to serve as an appropriate theoretical foundation for the present research.
The theory enables a generic and inclusive analysis by investigating five DI conditions: (1) relative advantage – whether or not the digital artifact is better than currently available solutions or workflows; (2) compatibility – whether or not the digital artifact adheres to the needs and expectations of its users; (3) complexity – whether or not the digital artifact is comprehensible and user-friendly; (4) trialability – whether or not the digital artifact can be tested; (5) observability – whether or not the digital artifact promotes clear-cut positive outcomes (Rogers, 2003).

2.2.2 Dynamic capabilities for successful digital implementation. Digital start-ups are affected by their external environment (Kimjeon and Davidsson, 2022). Therefore, we define DC as how digital start-ups create, develop, and sustain relevant organizational know-how and proficiencies to adapt and react to ambiguous and ever-changing environments (Teece, 2018). Unexpectedly, our understanding of the way digital entrepreneurial organizations develop and evolve DC remains largely unknown (Leso et al., 2023). Therefore, for digital entrepreneurship scholars, an extrinsic perspective (i.e. the challenges of the incumbents) is insufficient for investigating and understanding DI (Planko et al., 2017); notwithstanding, the intrinsic focus lies in the transformation that digital start-ups must undergo before, during, and after the implementation process and has not been sufficiently studied (Giglio et al., 2023).

DC are considered a theoretical backbone for studying the way firms develop and transform to bring about successful outcomes (Ilmudeen et al., 2020). Furthermore, DI represents a dynamic challenge (Schallmo et al., 2022). Simultaneously, DC are considered enablers for fundamental change and have served pivotal roles in configuring start-up–incumbent relationships, making this an appropriate theoretical approach (Teece, 2020). According to Teece (2014), in the entrepreneurial context, DC can be split into three main groups: (1) sensing – identifying and recognizing entrepreneurial opportunities; (2) seizing – utilizing available resources to exploit entrepreneurial opportunities and achieve economic growth; (3) transforming – continual reconfigurations, adaptations, and modifications that assist with and result in further growth.

2.3 Conceptual framework

Digital entrepreneurs possess the cognitive capabilities to discover entrepreneurial opportunities (Chen et al., 2020). As previously implied, they are alert to market disequilibria and possess robust digital capabilities that assist with connecting the dots (i.e. problem–solution fit) (Baron, 2006). Essentially, their goal in the early stages is to come up with a valid value proposition (VP) (Le and Suh, 2019). Their vision is to capitalize on disruptive VPs to digitally transform traditional business models and/or achieve digital business model innovation (Trischler and Li-Ying, 2023).

Nonetheless, they can only exploit entrepreneurial opportunities via the highly challenging task of new venture creation (Foss and Klein, 2020), which is a digital start-up in the digital entrepreneurship context. The conceptual problem–solution fit is hardly enough to build a sustainable business; therefore, digital start-ups search for a product–market fit (Xu and Koivumäki, 2019). Once it is found, they can finally replicate their digital business model for exponential growth (Mithani, 2023). For B2B digital start-ups, a valid digital business model signifies the fact that they can consistently grow via the value capture component (i.e. sales revenue), among others (Teece and Linden, 2017).

Linking the two theories together (Section 2.2), Table 1 presents our conceptual framework for a digital entrepreneurship perspective of holistic DI. This lens can serve as a basis for improving our understanding of how B2B digital start-ups evolve to succeed.

3. Methods

3.1 Research context and design

Contextualization has become a salient pillar in entrepreneurship research. Although this study deals with the digital context, it remains insufficient in this developing requirement
Sensing  
Digital entrepreneurs work diligently on opportunity discovery activities to polish their VP and explain how they can solve a challenge that has not yet been dealt with or handled (Le and Suh, 2019). Within the VP, the digital entrepreneurs, among others, illustrate why and in what ways their artifact is superior when compared to available substitutes (Todeschini et al., 2017).

Compatibility  
The VP is essentially the promise of value to the target audience (Payne et al., 2020). By using various framing techniques, digital entrepreneurs typically work to convince relevant stakeholders that their digital artifact is beneficial (e.g., cost saving; Reynolds et al., 2023; Yi et al., 2020).

Complexity  
Convincing stakeholders in the early stages is a challenging task (e.g., in cases where the digital technology used is very novel). Even more so, the entire industry might be novel and complex (e.g., the underexplored domain of the metaverse; Ferrigno et al., 2023). Therefore, consistently communicating the VP and framing it with the relevant stakeholders would eventually make it coherent (Castellano et al., 2021).

Trialability  
Once the VP is sufficiently polished, the digital entrepreneurs realize how to transform it into a minimal product with one or two “killer features”. The concept of the MVP helps digital entrepreneurs face reality for the first time, fail fast, and pivot (Blank and Eckhardt, 2023).

Observability  
Effectively framing the VP may result in gaining trust and developing the expectation that digital entrepreneurs can develop a digital artifact that can potentially solve the challenge and create a positive impact (Zutshi et al., 2021).

Table 1. Digital entrepreneurship perspective of holistic digital implementation
Relative advantage | Compatibility | Complexity | Trialability | Observability
---|---|---|---|---
Seizing | In the opportunity exploitation stage, digital start-ups strive to achieve a proof-of-concept (Mishra and Zachary, 2015). Such an achievement represents the fact that they can deliver an artifact that is undoubtedly superior and beneficial. Moreover, it shows that the newly established digital business model is ready for replication at scale (Mithani, 2023) | The proof-of-concept is not only about ensuring that the digital artifact works well (i.e. value creation) but also signals a firm potential for sustainable business rather than a mere technical initiative (Foss and Klein, 2020; Maia and Claro, 2013). Moreover, B2B digital start-ups must be very firm regarding how their digital artifact fits the incumbent’s digital strategy (Schallmo et al., 2022) | Once the MVP (and even later versions of the relatively raw digital artifact) is ready for commencing pilots with design partners, this is the point at which the reciprocal benefits of these trials occur. On the one hand, digital start-ups should fix bugs on the go with minimal losses. On the other hand, the partner receives salient answers to all previously mentioned questions that may arise during the discovery stage or later (Nobari and Dehkordi, 2023) | Certain institutions act as innovation intermediaries to ensure that the mutual co-creation between digital start-ups and incumbents has predefined goals and measurable results (Garcia Martin et al., 2023)

Transforming | During the artifact’s development, the digital start-up must remain alert for ways to continue improving and innovating to avoid losing any hard-gained momentum (Lehmann and Recker, 2022). For example, if a new technology enters the market, they must reevaluate the opportunity and sometimes pivot and implement it themselves (Bohn and Kundisch, 2020) | As the relationships with current customers develop and efforts are made to recruit prospective customers, their needs and preferences unfortunately change over time (Hanelt et al., 2021); therefore, active listening is imperative, followed by acting accordingly when appropriate (Srivastava et al., 2021; Zaheer et al., 2019b) | Even after the digital artifact is operating well and sold at scale, the digital start-up continues developing and innovating it further, as implied. Consequently, B2B digital start-ups provide constant support to their customers and users to reduce any misunderstandings or miscommunications (Hochstein et al., 2021) | As part of the aforementioned support process, digital start-ups work closely with incumbents to measure results and fix issues that arise from crises (Hutter et al., 2021)

Source(s): Authors’ own work
In a recent opinion article, the founder of Playbuzz and Pigi, Mr. Shaul Olmert (2023), discussed a case study of Pillsbury, in which people who baked pastries using their ready-to-bake refrigerated dough were not satisfied with the results because they did not feel it was their genuine craft. He emphasized that this is a lesson they are trying to incorporate when digitally implementing Pigi’s generative AI solution; thus, they added a “human touch” to their product.

Considered a real-world phenomenon, DI is challenging for many other Israeli digital start-ups. Therefore, we chose to focus on the Israeli digital entrepreneurial ecosystem as our research setting. Globally considered a “start-up nation,” Israel enjoys a high start-up per capita ratio, with many of these start-ups being digital and born-global (Balicer and Afek, 2017; Efrat and Asseraf, 2019; Hashai, 2015). This makes the Israeli digital entrepreneurial ecosystem appropriate for our research.

This contextualization need, our minimal to no control over the explained variable (i.e. digital entrepreneurship success generally and augmenting sales revenue specifically), and the aforementioned lack of theoretical foundation made us opt for the use of qualitative methods for our investigation (Bodolica et al., 2015; Preller et al., 2023; Sastararuji et al., 2022). Specifically, since we aimed to decipher intricate mechanisms within challenging relationships, an explanatory case study was an appropriate fit for this study (Garcia Martin et al., 2023; Yin, 2018).

Traditionally, the case study approach has not found much popularity in entrepreneurship research (Henry and Foss, 2015). Despite this, it allows a contextual investigation of real-world phenomena and is appropriate for answering “What?” and “How?” types of research questions (Gölgeci et al., 2021; Yin, 2018). However, the DI challenges faced by B2B digital start-ups are not only context-dependent but also multifaceted (Schallmo et al., 2022) because they are influenced by many factors that we wish to further understand. Additionally, since digital entrepreneurship is an iterative and dynamic process (Aloulou et al., 2023), relevant organizations are constantly changing and evolving. This challenge entails the tracing of relevant strategies that bring about successful advancement in the digital entrepreneurial journey (Berman et al., 2023). In light of these conditions, we chose a multi-case study approach (Eisenhardt, 1989; Yin, 2018) to better understand the DI challenges and methodologies experienced, developed, and mastered by digital exemplars such as digital start-ups across various sectors. Following a study by Dana and Dumex (2015), we opted for the organizational level of analysis. As a result, digital start-ups are the unit of analysis in this study.

3.2 Case selection

We concentrated our research on four industries, which is the minimum number that scholars suggest for extracting the benefits of case studies (Stake, 2005). The chosen industries are agriculture, insurance, real estate and construction, and healthcare.

Notably, the case study methodology is only appropriate if the case selection is based on specific criteria (Eisenhardt, 1989). Therefore, these industries must be quite different from each other to bring about cumulative knowledge. For example, in agriculture, the relatively old average age of its actors (e.g. 59 in the UK; Gittins, 2022) negatively affects their digital capabilities and literacy levels (Tirado-Morueta et al., 2018), whereas in healthcare, various actors differ in terms of these attributes and their DI preferences (e.g. medical doctors vs. nurses; de Jong et al., 2020).

Furthermore, the chosen industries had to be those in which Israeli B2B digital start-ups are very active (e.g. healthcare; Balicer and Afek, 2017), while also being industries facing intricate DI-related issues (e.g. Tal, 2021).
3.3 Data collection
During 2021 and 2022, we interviewed 40 experts (Table 2), with an even split between all cases. Since we aimed to hear from representatives of both sides of the start-up-incumbent relationship, within cases, we evenly split the interviewees between digital start-up founders or top executives on one hand, and incumbents’ executives or other relevant industry experts on the other. We opted for the popular semi-structured approach because by asking open-ended questions and having an open conversation with the participants, we could gain vast knowledge on the subject (Harrell and Bradley, 2009).

Nevertheless, using only one data source in case studies is unsatisfactory (Gioia et al., 2013). As such, for triangulation, we also initiated archival digital data research by investigating start-up databases (e.g. TechCrunch) because this type of source has recently become popular in entrepreneurship research (Feldman et al., 2022). This form of triangulation should help in the investigation of novel topics such as digital entrepreneurship success (Van Burg et al., 2022).

3.4 Research process
Figure 2 depicts the process of our entire study and elaborated further in this section.

3.4.1 Phase 1: within-case analysis. Using our acquired data, we initiated an inductive within-case analysis with each case analyzed separately and its findings presented as a single case study because this allowed us to concentrate on similarities and formulate the research questions (Klein et al., 2021; Zerbinati and Souitaris, 2005). Moreover, this has made us opt for an abductive approach because moving back and forth from the data to the relevant literature seemed imperative (Awuzie and McDermott, 2017).

3.4.2 Phase 2: literature review. A theoretical backbone is necessary for researching real-world phenomena such as DI (Baskerville and Dulipovici, 2006). Nevertheless, this research topic has been over-reliant on inductive research, resulting in heavy fragmentation (Giglio et al., 2023). Therefore, we opted for the approach of Burström et al. (2023), which integrated digital entrepreneurship literature and constructs into the holistic digitalization theory (see Section 2.1.2). This helped us create the necessary definitions and choose the appropriate theoretical foundation.

3.4.3 Phase 3: conceptual framework. Since we aimed to decipher DI in the context of the challenging relationship between digital start-ups and incumbents, we had to re-approach the literature by seeking relevant theories and combining some theories as required. Therefore, by integrating the two theories (see Section 2.3), we created a relevant fundamental conceptual framework since this is a requirement for explanatory case studies (Gartner et al., 2022; Köhler et al., 2022). This framework enabled a holistic view of the digital entrepreneurship perspective of DI, meaning that we could holistically and thoroughly analyze the interviews.

3.4.4 Phase 4: between case analysis. We then commenced a comparative analysis by consolidating the single case studies into a multi-case study to achieve better generalization of the findings (Eisenhardt and Graebner, 2007).

For content analysis, we used a priori coding. Such an abductive approach provides a focused analysis of the collected data and strengthens the results in case studies (Eisenhardt, 1989; Nili et al., 2020). ATLAS.ti 23 was used as a tool for coding because this instrument is appropriate for qualitative data analysis (Haftor and Costa, 2023). Overall (excluding duplicates), we constructed 377 unique codes, which emphasizes the richness of our collected data.

Moreover, we conducted a thematic analysis. This was chosen since it allows for maximum flexibility on one hand and helps gain insights by finding patterns based on the participants’ shared experiences and beliefs on the other (Braun and Clarke, 2006). Axial
<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Company/institution</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Type C executive</td>
<td>AgTech start-up</td>
<td>14/02/2021</td>
</tr>
<tr>
<td>A2</td>
<td>Co-founder and CEO</td>
<td>AgTech start-up</td>
<td>15/02/2021</td>
</tr>
<tr>
<td>A3</td>
<td>Co-founder and CEO</td>
<td>AgTech start-up</td>
<td>16/02/2021</td>
</tr>
<tr>
<td>A4</td>
<td>Co-founder and CMO</td>
<td>AgTech start-up</td>
<td>18/02/2021</td>
</tr>
<tr>
<td>A5</td>
<td>Co-founder and CEO</td>
<td>AgTech start-up</td>
<td>18/02/2021</td>
</tr>
<tr>
<td>A6</td>
<td>Head of irrigation</td>
<td>Field crops at a northern kibbutz</td>
<td>18/02/2021</td>
</tr>
<tr>
<td>A7</td>
<td>Farm owner</td>
<td>Pepper and date farm</td>
<td>21/02/2021</td>
</tr>
<tr>
<td>A8</td>
<td>Farm owner</td>
<td>Vertical farm</td>
<td>23/02/2021</td>
</tr>
<tr>
<td>A9</td>
<td>Independent farming contractor</td>
<td>Farms in the Hula Valley</td>
<td>25/02/2021</td>
</tr>
<tr>
<td>A10</td>
<td>Farm owner</td>
<td>Flower farm in Southern Israel</td>
<td>28/02/2021</td>
</tr>
</tbody>
</table>

**Insurance**

<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Company/institution</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Innovation leader</td>
<td>The Israeli branch of a global insurance group</td>
<td>01/07/2021</td>
</tr>
<tr>
<td>I2</td>
<td>Founding partner</td>
<td>FinTech consultancy firm</td>
<td>05/07/2021</td>
</tr>
<tr>
<td>I3</td>
<td>CEO</td>
<td>InsurTech consultancy firm that runs an accelerator and invests in relevant start-ups</td>
<td>11/07/2021</td>
</tr>
<tr>
<td>I4</td>
<td>VP of innovation</td>
<td>The Israeli branch of a global insurance group</td>
<td>12/07/2021</td>
</tr>
<tr>
<td>I5</td>
<td>VP of technology and innovation</td>
<td>A large Israeli automobile conglomerate</td>
<td>19/08/2021</td>
</tr>
<tr>
<td>I6</td>
<td>Co-founder and CEO</td>
<td>InsurTech start-up</td>
<td>06/07/2021</td>
</tr>
<tr>
<td>I7</td>
<td>Serial entrepreneur, Co-founder, and CTO</td>
<td>InsurTech start-up</td>
<td>08/07/2021</td>
</tr>
<tr>
<td>I8</td>
<td>Co-founder and COO</td>
<td>InsurTech start-up</td>
<td>11/07/2021</td>
</tr>
<tr>
<td>I9</td>
<td>Co-founder and CTO</td>
<td>InsurTech start-up</td>
<td>14/07/2021</td>
</tr>
<tr>
<td>I10</td>
<td>Co-founder and CEO</td>
<td>InsurTech start-up</td>
<td>20/07/2021</td>
</tr>
</tbody>
</table>

**Real estate and construction**

<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Company/institution</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Marketing and innovation executive</td>
<td>Real estate entrepreneurship corporate</td>
<td>06/12/2021</td>
</tr>
<tr>
<td>R2</td>
<td>Innovation manager</td>
<td>Real estate fund</td>
<td>07/12/2021</td>
</tr>
<tr>
<td>R3</td>
<td>Chairman of the board</td>
<td>Real estate investment fund</td>
<td>09/12/2021</td>
</tr>
<tr>
<td>R4</td>
<td>CEO</td>
<td>Construction innovation center</td>
<td>14/12/2021</td>
</tr>
<tr>
<td>R5</td>
<td>Capital markets director</td>
<td>Real estate investment management</td>
<td>21/12/2021</td>
</tr>
<tr>
<td>R6</td>
<td>Co-founder and CEO</td>
<td>ConTech start-up</td>
<td>06/12/2021</td>
</tr>
<tr>
<td>R7</td>
<td>Co-founder and CEO</td>
<td>Publicly traded ConTech company on TASE</td>
<td>10/12/2021</td>
</tr>
<tr>
<td>R8</td>
<td>Co-founder and CTO</td>
<td>Recently acquired PropTech start-up</td>
<td>13/12/2021</td>
</tr>
<tr>
<td>R9</td>
<td>Co-founder and CEO</td>
<td>ConTech start-up</td>
<td>16/12/2021</td>
</tr>
<tr>
<td>R10</td>
<td>Co-founder and CEO</td>
<td>ConTech start-up</td>
<td>28/12/2021</td>
</tr>
</tbody>
</table>

**Healthcare**

<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Company/institution</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Senior radiologist</td>
<td>Public hospital</td>
<td>13/07/2022</td>
</tr>
<tr>
<td>H2</td>
<td>Founding partner and CIO</td>
<td>HealthTech-focused venture capital fund</td>
<td>14/07/2022</td>
</tr>
<tr>
<td>H3</td>
<td>Former HealthTech investor and current head of community</td>
<td>HealthTech bottom-up community</td>
<td>14/07/2022</td>
</tr>
<tr>
<td>H4</td>
<td>Head of an innovation center</td>
<td>Public hospital</td>
<td>17/07/2022</td>
</tr>
<tr>
<td>H5</td>
<td>Director of start-ups</td>
<td>Public hospital</td>
<td>27/07/2022</td>
</tr>
<tr>
<td>H6</td>
<td>Co-founder and CTO</td>
<td>HealthTech start-up</td>
<td>13/07/2022</td>
</tr>
<tr>
<td>H7</td>
<td>Founder and CEO</td>
<td>HealthTech start-up</td>
<td>14/07/2022</td>
</tr>
<tr>
<td>H8</td>
<td>CTO</td>
<td>HealthTech start-up</td>
<td>18/07/2022</td>
</tr>
<tr>
<td>H9</td>
<td>Co-founder and CEO</td>
<td>HealthTech start-up</td>
<td>26/07/2022</td>
</tr>
<tr>
<td>H10</td>
<td>Co-founder and CTO</td>
<td>HealthTech start-up</td>
<td>02/08/2022</td>
</tr>
</tbody>
</table>

**Source(s):** Authors’ own work

**Table 2.** Participants’ profiles
codes and aggregated dimensions were chosen according to the conceptual framework and the notable theories previously discussed.

4. Findings
As previously implied, and based on our data, a major achievement in the world of B2B digital start-ups is the ability to capture value. “The fact that I have paying customers means that I’m successful (I10).”

In the following sections, we will describe the activities that digital start-ups perform to successfully implement their digital artifacts and enable value capture. Our description is divided based on the DC that represent the entrepreneurial journey (Figure 3).

4.1 Sensing
We identified 71 different challenges experienced by incumbents (Table 3) in our data, covering most aspects of any ecosystem (i.e. commercial, operational, social, economic, political, and technological). At the top of our list, we found three technological challenges that require external assistance.

Evidently, incumbents turn to digital exemplars to develop innovative digital artifacts. “Our travel insurance application is handy during these COVID-19 times […] This app was built with the help of an external vendor that developed it for us (I4)”. Being alert to this, digital entrepreneurs start their journey by recognizing and evaluating opportunities. First, they conduct firm market research and analysis. Notably, they do not conduct it in the same way that conventional market analysts would. Alternatively, they integrate their entrepreneurial mindset into it, often by using their existing background and experience. However, even in cases where they lack these characteristics, they actively seek available opportunities in the market and simultaneously use other beneficial skills (e.g. their robust digital capabilities) to acquire vast knowledge in the process.

As previously implied, they ultimately seek to connect the dots and come up with a precise VP. We identified 56 different VPs in our data (Table 4). Most of these align with the aforementioned challenges of the incumbents. For example, making workflows more efficient is compatible with current workflows that are inefficient, while aiming for automation aligns...
<table>
<thead>
<tr>
<th>First-order Concepts</th>
<th>Second-order Themes</th>
<th>Aggregated Dimensions</th>
</tr>
</thead>
</table>
| • Commercial Challenges  
• Economic Challenges  
• Political Challenges  
• Operational Challenges  
• Social Challenges  
• Technological Challenges | Incumbents’ Challenges | Sensing |
| • Market and Industry Knowledge  
• Entrepreneurial Mindset  
• Communication of VP | Available DCs | |
| • Compatibility  
• Complexity  
• Observability  
• Trialability  
• Relative Advantage | Implementation Hardships | Seizing |
| • Strategic Partnerships  
• Customer Engagement  
• Efficiency and Flexibility  
• Financial Planning  
• Risk Management and Mitigation | Newly Developed DCs | |
| • Market Analysis and Selection  
• Exploiting Opportunities | Evolved DCs | |
| • Market Focus and Branding  
• Strategic Networking  
• Customer-centric Mindset  
• Operational Excellence  
• Maintaining Entrepreneurial identity  
• Financial Management  
• Innovation and Technological Development | Further Evolved DCs | Transforming |

Source(s): Authors’ own work

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current workflows are inefficient</td>
<td>Operational</td>
<td>45</td>
</tr>
<tr>
<td>Shortage of manpower</td>
<td>Social</td>
<td>37</td>
</tr>
<tr>
<td>Lack of resources and their high cost</td>
<td>Economic</td>
<td>36</td>
</tr>
<tr>
<td>New entrants are changing the industry’s mindset</td>
<td>Commercial</td>
<td>35</td>
</tr>
<tr>
<td>Very weak digital capabilities</td>
<td>Technological</td>
<td>30</td>
</tr>
<tr>
<td>Intuitive and habitual decision-making and workflows</td>
<td>Operational</td>
<td>23</td>
</tr>
<tr>
<td>Increasing regulation</td>
<td>Political</td>
<td>22</td>
</tr>
<tr>
<td>Customers’ expectations are rising</td>
<td>Commercial</td>
<td>21</td>
</tr>
<tr>
<td>Profits are diminishing</td>
<td>Economic</td>
<td>20</td>
</tr>
<tr>
<td>Lack of interoperability</td>
<td>Technological</td>
<td>18</td>
</tr>
<tr>
<td>Need for holistic solutions</td>
<td>Technological</td>
<td>18</td>
</tr>
</tbody>
</table>

Note(s): Since the last two items had the same count, we presented 11 challenges
Source(s): Authors’ own work

Table 3. Incumbents’ challenges
with the shortage of manpower and focusing on financials is compatible with diminishing profits.

To prepare themselves for the actual digital artifact implementation stage as part of their entrepreneurial mindset (e.g. actively searching for opportunities), they must realize how to advance from the ability to coherently communicate their VP to creating a sustainable venture. They must ensure that their weaknesses (e.g. the venture’s risks or the technology’s shortcomings) can be improved with time and that their business model can create a comprehensible market differentiation from the competing solutions available.

**4.2 Seizing**

Digital start-ups are constantly seeking various opportunities to exploit. For example, during the adversities of the COVID-19 pandemic, many incumbents accelerated their digital transformation processes and were ready to implement all available digital artifacts, even those that were not completely ready for implementation. Nevertheless, we found many similar opportunities in our data, such as generational changes, where younger people who are digital natives take over decision-making positions and are more open to digital innovation than their older predecessors.

However, as previously implied, even in scenarios where there is a reciprocal willingness to create and sustain a commercial relationship, the DI process can face severe hardship. In our data, we identified 87 challenges (Table 5) that digital start-ups face when attempting to align their digital artifacts with incumbents’ business models and digital strategies.

<table>
<thead>
<tr>
<th>Hardship</th>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological change is very slow</td>
<td>Relative Advantage</td>
<td>79</td>
</tr>
<tr>
<td>Conservative mindset</td>
<td>Complexity</td>
<td>43</td>
</tr>
<tr>
<td>Technology has its limits</td>
<td>Relative Advantage</td>
<td>32</td>
</tr>
<tr>
<td>Outdated technological infrastructure</td>
<td>Compatibility</td>
<td>26</td>
</tr>
<tr>
<td>Reluctance to completely relinquish control to technology</td>
<td>Compatibility</td>
<td>24</td>
</tr>
<tr>
<td>Rather trust a human being</td>
<td>Relative Advantage</td>
<td>20</td>
</tr>
<tr>
<td>Lack of interoperability</td>
<td>Complexity</td>
<td>18</td>
</tr>
<tr>
<td>Need for holistic solutions</td>
<td>Compatibility</td>
<td>18</td>
</tr>
<tr>
<td>Older people’s technological challenges</td>
<td>Compatibility</td>
<td>17</td>
</tr>
<tr>
<td>Do nothing mentality</td>
<td>Complexity</td>
<td>15</td>
</tr>
</tbody>
</table>

*Source(s): Authors’ own work*

<table>
<thead>
<tr>
<th>Value proposition types</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making processes, decisions, and workflows more efficient</td>
<td>99</td>
</tr>
<tr>
<td>Focusing on financials (increasing revenue and/or cutting costs)</td>
<td>89</td>
</tr>
<tr>
<td>Aiming for automation</td>
<td>62</td>
</tr>
<tr>
<td>Technology brings more accurate results</td>
<td>36</td>
</tr>
<tr>
<td>Technology is revamping and taking over traditional jobs</td>
<td>33</td>
</tr>
<tr>
<td>Aiming and searching for new and improved production methods</td>
<td>32</td>
</tr>
<tr>
<td>Improving customer experience and service</td>
<td>27</td>
</tr>
<tr>
<td>Time-saving</td>
<td>26</td>
</tr>
<tr>
<td>Technology improves productivity and performance</td>
<td>24</td>
</tr>
<tr>
<td>Moving to “predict and prevent” mode</td>
<td>22</td>
</tr>
</tbody>
</table>

*Source(s): Authors’ own work*
Notably, these hardships range across the factors mentioned in Section 2.2.1. Some types of opposition to DI are objective (e.g. technology cannot solve all challenges), whereas many others are subjective. Some subjective types of opposition emerge from internal forces that may resist change (e.g. silo mentality), while others emerge from limiting infrastructure (e.g. overreliance on paperwork).

Therefore, at this stage, where the entrepreneurs formally create(d) a formal business out of their entrepreneurial ideation, they continue to conduct market analyses. They answer important initial questions, such as where to physically start their venture. They usually look for prime locations where there is a fundamentally sound digital entrepreneurial ecosystem, the type that increases their chances of raising funds and obtaining access to potential partnerships (e.g. with other relevant digital start-ups).

Such an ecosystem also enables the formation of salient strategic partnerships, especially for experimenting digital start-ups seeking design partners. Value co-creation assists in bridging many of the aforementioned hardships—especially the subjective ones that are far more challenging according to our data. Such strategic partnerships and knowledge sharing with incumbents and fellow digital start-ups enable constant learning, which is a fundamental pillar of the lean start-up methodology.

Digital start-ups must be both efficient and flexible to implement the lessons learned and modify their artifacts. Being efficient allows digital start-ups to succeed in the pilots started with their design partners while simultaneously maintaining a manageable risk level and not running out of financial resources. For example, our data indicate that to bridge the hardship of older people’s challenges in understanding and using sophisticated digital technologies, digital start-ups must work hard to simplify their business models (e.g. using commonly accepted models in the market) and the output of their artifacts.

Figure 4 summarizes our findings in this section by depicting digital start-ups’ approach to an effective DI.

4.3 Transforming

Upon successfully attaining a proof-of-concept, digital start-ups leverage the replicability potential of digital technologies to foster growth. This involves digitally implementing their artifacts on a larger scale and continually penetrating new markets.

Our findings indicate that at this stage, digital start-ups further develop DC to transform their leaders’ roles from venture creators (and other professional managers that were brought in to complement such leaders’ weaknesses; Shepherd and Patzelt, 2022) to digital entrepreneurial leaders. Commercial capabilities, such as appropriately engaging with customers, further evolve to capabilities such as achieving a customer-centric mindset, and market focus and branding, as well as operational capabilities such as mitigating risks to financial management.

Since digital entrepreneurial leaders are essentially strategic leaders, they must also develop a strategic vision for the digital start-up’s further growth. Furthermore, digital start-
ups continue to develop their strategic networks for that purpose. One important finding is that due to the current information overload and lack of interoperability, customers seek holistic solutions rather than more niche ones. As a result, digital start-ups continue improving their solutions through innovation to present customers with new options. This essentially involves moving from the role of a specialist or generalist to the role of a system-of-systems creator (Berman et al., 2023a). Alternatively, they bundle their niche solutions with strategic partners’ or competitors’ products, if possible.

Finally, since moving to new markets and adding more features to solve additional incumbents’ challenges requires a great deal of adaptability and flexibility, which are basic entrepreneurial traits, digital start-ups are making efforts to maintain the entrepreneurial DNA and identity for as long as possible.

5. Discussion
Previous research has shown that digital start-ups strive to achieve many goals (e.g. customer satisfaction and internationalization; Felicetti et al., 2023). However, two main goals have recently emerged and become very significant for such organizations: raising financial funds and augmenting sales revenue (e.g. Berman et al., 2023b). Since DI serves as an engine for digital start-ups to successfully replicate digital business models at scale, it is mainly concerned with the latter goal. Consequently, as our analysis has shown, it can be considered a driver of digital entrepreneurship success.

Due to the aforementioned gap in the literature (Leso et al., 2023), similar to our study, previous research has investigated how digital entrepreneurial firms evolve various DC (e.g. efficiency; Balboni et al., 2019). Notwithstanding, our study investigated the topic in a holistic (i.e. presenting as many DC as the experts shared with us that are reflected in the entire entrepreneurial journey) and contextualized (i.e. the relationship between B2B digital start-ups and industry incumbents) manner. Using such an inclusive approach, we identified a reciprocal relationship between successful DI and DC development in digital start-ups. This finding suggests that they create much-needed DC during the sensing and seizing stages. Notably, these DC further improve and evolve throughout their journeys. This implies that certain DC help digital start-ups achieve successful DI, while successful DI helps digital start-ups with developing and evolving DC. As summarized in Table 6, this type of cycle helps

<table>
<thead>
<tr>
<th>Sensing</th>
<th>Seizing</th>
<th>Transforming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducting a market and industry analysis</td>
<td>Conducting a market analysis and selection</td>
<td>Striving for market focus and branding</td>
</tr>
<tr>
<td>–</td>
<td>Building strategic partnerships</td>
<td>Building strategic networks</td>
</tr>
<tr>
<td>–</td>
<td>Engaging well with customers</td>
<td>Achieving a customer-centric mindset</td>
</tr>
<tr>
<td>–</td>
<td>Ensuring efficiency and flexibility</td>
<td>Achieving operational excellence</td>
</tr>
<tr>
<td>–</td>
<td>Effective financial planning</td>
<td>Maintaining entrepreneurial identity</td>
</tr>
<tr>
<td>–</td>
<td>Effective risk management and mitigation</td>
<td>Effective financial management</td>
</tr>
<tr>
<td>Bring about the entrepreneurial mindset</td>
<td>Exploiting entrepreneurial and business opportunities</td>
<td>Constant innovation and technological development</td>
</tr>
<tr>
<td>Communicating the VP well</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source(s): Authors’ own work
digital start-ups successfully grow in scale. For example, to start building their MVP version of an artifact, digital entrepreneurs must successfully engage with customers. Using the salient dynamic capability of continuous improvement and learning, they educate themselves about their customers' needs and implementation hardships to ultimately commence successful pilots. Thereafter, when they start their commercial relationships with customers, this dynamic capability evolves into a customer-centric mindset. This finding improves our understanding of the evolution of digital start-ups during the DI process (Giglio et al., 2023) and how they can utilize such successful processes to further scale up (Shepherd and Patzelt, 2022).

Moreover, since we mentioned the importance of continuous improvement and learning, it is apparent from our findings that digital start-ups engage in a hybrid interplay of both causation and effectuation logic during their strategic decision-making processes when engaged in DI. Notably, this observation is congruent with scholarly understandings (e.g. Galkina et al., 2022). Successfully implementing digital artifacts involves setting goals and adhering to them (e.g. growth via the value capture component). In our case, the causation logic is reflected in staying focused and not changing the course of action too often, for example. Nevertheless, as a dynamic challenge, DI requires entrepreneurial traits such as creative thinking, flexibility, and adaptability; for example, developing and implementing an artifact in stages is a form of experimentation that involves utilizing effectuation logic (Khurana et al., 2022; Sarasvathy, 2001). In summary, existing research indicates that utilizing both logics in parallel should result in successful outcomes (Reymen et al., 2015). As such, we were able to empirically present this in the current study.

6. Conclusion
6.1 Theoretical contributions
Our paper answered three calls for improving digital entrepreneurship research. First, we integrated the fields of entrepreneurship and information systems (Steininger, 2019) by incorporating digital start-ups and illustrating their roles in (to) the holistic digitalization theory. Secondly, we presented an explicit digital economy-related driver (i.e. DI) for digital entrepreneurship success using a highly ranked country on the GEI (Acs and Szerb, 2009) as a research setting (Berman et al., 2023). Lastly, we used digital start-ups as the unit of analysis, unlike previous research that primarily concentrated on the individual level and picked digital entrepreneurs as their unit of analysis (Berman et al., 2023; Dana and Dumez, 2015).

In this study, we showed how using a lean start-up methodology related DC (e.g. continuous improvement and learning) digital entrepreneurs can develop, improve, and evolve other DC [e.g. from market research (sensing) to market selection (seizing), to market focus (transforming)]. Moreover, we provided empirical evidence of how digital start-ups are combining causation and effectuation logic throughout their DI journeys.

6.2 Practical implications
Our research has certain practical implications for policymakers and digital entrepreneurs. First, we demonstrated why and how DI is a driver of digital entrepreneurship success. This is essential because policymakers have recently realized that it is not enough to increase entrepreneurial engagement. Instead, the goal should be to increase the success rate of newly established digital ventures (Shane, 2009). Furthermore, by reading this paper, digital entrepreneurs will learn a practical and effective approach to successful DI that can increase their likelihood of capturing value and ultimately becoming (more) successful.
6.3 Limitations and future research directions
As with all research, this study is not free of certain limitations. First, some of our interviews were conducted 3 years ago. Although we made sure this data remains relevant with the assistance of digital data investigations, future research would still need to validate these. Second, case studies customarily present a challenge with generalizing their findings. Thus, to minimize this inherent limitation, we opted for a multi-case study that is quite rigorous (Eisenhardt, 1989). Nevertheless, the study’s context was limited to Israel. However, as explained, this context is an appropriate fit for studying DI. To promote better generalization of the findings, future research should involve other geographical settings, especially those that represent highly ranked GEI countries (Berman et al., 2023). Third, due to the aforementioned scrutiny, it is advised that case studies be empirically tested. However, case studies that achieve this goal are quite extraordinary (Tsang, 2013). Due to time constraints, we could not adhere to this recommendation. Therefore, future research would greatly assist with testing our model using a deductive approach. Lastly, we looked at DI as a generic construct based on past research that categorized it as such (e.g. Schallmo et al., 2022). However, it is quite clear that various digital technologies offer distinctive implementation challenges for both digital start-ups and incumbents. Consequently, this study is merely a stepping stone for much-needed future research. As such, scholars should use our findings to investigate digital start-ups’ specific implementations of popular digital technologies (e.g. artificial intelligence).

Aside from future research that can overcome our study’s limitations, more general avenues for future research exist. First, we articulated the saliency of continuous learning and improvement. Since this DC is at the heart of our study, future research can use multiple approaches from many management-related fields to improve our understanding of how digital entrepreneurs and start-ups specifically develop it. Such research should rely on theories such as knowledge spillover and absorptive capacity as a backbone (Kirschning and Mrożewski, 2023). Furthermore, there has been a recent rise in the use of sustainable practices that drive entrepreneurial actions in digital ventures (e.g. Almansour, 2024). Consequently, in light of Guimarães et al.’s (2023) observation, future similar research focusing on the topic of sustainable DC would help further promote this growing field of study while prompting even more interdisciplinarity.

References


Corresponding author
Sascha Kraus can be contacted at: sascha.kraus@zfke.de