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Managing Ambidexterity in Startups Pursuing Digital Innovation

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Abstract:

With the current pace of digital innovation, corporations and startups alike are experiencing the challenge of surviving in hypercompetitive environments. Accordingly, the management literature proposes “organizational ambidexterity”, the ability to balance exploitative and exploratory efforts, as a means of survival. Based on observations and interviews with startups and investors affiliated with the entrepreneurial educational program SCALEit, this study investigates how startups can manage ambidexterity in pursuing digital innovation. Our study concludes that startups conducting digital innovation manage to attain organizational ambidexterity through internal and external adaptation by combining and enacting competencies. The startups have access to a competency portfolio that comprises eight core competencies across organizational boundaries. The startup CEO, team members, and individuals in the ecosystem that surround the startup provide these competencies, which reveals a new perspective on how to achieve organizational ambidexterity through leveraging both internal and external competencies.

Keywords: Ambidexterity, Digital Innovation, Startups, Competencies, Contextual Ambidexterity, Ecosystem.

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1 Introduction

Since passing the 50th anniversary of Moore's law, we have, according to Fichman, Dos Santos, and Zheng (2014), entered the golden age of digital innovation. They define digital innovation as "a product, process, or business model that is perceived as new, requires some significant changes on the part of adopters, and is embodied in, or enabled by, IT" (p. 330). Yoffie (1996) anticipated the rising pace of digital innovation and described it in terms of "digital convergence". This digital convergence has caused previously separate functions in individual digital technologies to unify and intertwine, which has led to a major disruption of global business. Indeed, a report from Innosight (2012) highlights the fact that global business has changed in documenting that the turnover of companies on Standard and Poor's 500 Index has significantly increased from an expected average of 61 years in 1958 to only 18 years in 2012.

D'Aveni (1998) describes how industries such as consumer electronics, telecommunications, and computer industries have changed "to environments, characterized by intense and rapid competitive moves, in which competitors strike quickly with unexpected, unconventional means of competing" (D'Aveni, 1998: 183). To describe this new market situation, D'Aveni (1998) introduced the term "hypercompetition" as a contrast to previously where "firms sought to sustain a competitive advantage, seen as the 'holy grail' of strategy" (p. 183). An organization previously simply had to sustain competitive advantages to ensure its survival. However, the need to continuously generate new competitive advantages defines the hypercompetitive market we see today (D'Aveni, 1998). Therefore, being a large and successful company at one point in time does not guarantee that it will continue to prosper (O'Reilly & Tushman, 2008) since established companies experience difficulties in rearranging their resources quickly enough to sustain competitive advantages (Freeman & Engel, 2007). Freeman and Engel (2007) offer the struggle among established corporations as one reason to explain how a window in time opens and allows innovators such as startups to gain a temporary advantage (Freeman & Engel, 2007). In this regard, Freeman and Engel (2007) emphasize that, over the last 50 years, the number of technology-based startups has grown due to the fact that they have created the competencies to leverage changes in technology and their affiliated market disruptions and, thus, brought "new products to market relatively quickly, while their larger but slower corporate competitors [have] lag[ged] behind" (Freeman & Engel, 2007, p. 95). Consequently, the digital age has fostered a rise of startups acting as front-runners in digital innovation (Fichman et al., 2014; Yoffie, 1996). Such startups engage in digital innovation through a business model embodied or enabled by IT (Fichman et al., 2014). In general, we can define a startup as an organization "searching for a repeatable and scalable business model" (Blank & Dorf, 2012, p. 39) where the business model describes how the organization creates, delivers, and captures value. Therefore, a startup does not have the same established business processes as a corporation and typically has less capital and fewer employees and strategic alliances (Freeman & Engel, 2007).

To sustain competitive advantage in hypercompetitive environments, the management literature has highlighted that companies need to excel at ambidextrous behavior, which encompasses the paradoxical ability to simultaneously exploit existing competencies through short-term optimization and explore new opportunities through long-term innovation (Andriopoulos & Lewis, 2009; Du, Pan, & Zuo, 2013; O'Reilly & Tushman, 2008; Smith & Tushman, 2005). The majority of existing research on ambidexterity has neglected startups as an interesting unit of analysis (Lubatkin, Simsek, Ling & Veiga, 2006; Raisch & Birkinshaw, 2008) with some notable exceptions (Beckman, 2006; Kuckertz, Kohtamäki, & Körber, 2010; Mueller, Volery, & von Siemens, 2012; Parida, Lahti, & Wincent, 2016; Volery, Mueller, & von Siemens, 2015). Particularly, research has overlooked the unique characteristics and required competencies of startups that engage in digital innovation. As a process, we can conceptualize digital innovation as "the carrying out of new combinations of digital and physical components to produce novel products" (Yoo, Henfridsson, & Lyytinen, 2010a, p. 725). These new combinations are enabled by digital technology, which, through its affordances, support an environment of openness and flexibility in creating innovations characterized by convergence and generativity (Yoo, Boland, Lyytinen, & Majchrzak, 2012). Such innovations transform the "socio-technical structures that were previously mediated by non-digital artifacts or relationships into ones that are mediated by digitized artifacts and relationships" (Yoo, Lyytinen, Boland, & Berente, 2010b, p. 6). In fact, the literature emphasizes that digital innovation uniquely differs from other types of innovation. Startups that focus on developing new products and services in the digital domain require new competencies compared to startups that work in other domains. Thus, Herterich and Mikusz (2016) stress that "digital innovation goes beyond traditional product functionality of the physical artifact and traditional mechanisms in innovation literature" (p. 1). The generativity associated with digital technology changes the

industrial landscape, and “traditional theories that provide guidance for strategic management of modular innovation can no longer offer effective guidance in a world of generative digitized artifacts” (Herterich & Mikusz, 2016, p. 15), which leads to a call for future research studies that provide guidance on digital innovation, including the competencies needed. Therefore, startups pursuing digital innovation—as opposed to other types of innovation—represent a highly relevant unit of analysis and the focal point of this paper. As a theoretical lens, digital innovation draws on socio-materiality to allow for new ways to interpret innovations in the digital realm. We extend state-of-the-art knowledge on ambidexterity in startups by focusing on the particular challenges (e.g., the high dependency on business networks) in combining digital and physical components in developing new service and product innovations. As such, we formulate the following research question (RQ):

RQ: How can startups pursuing digital innovation manage ambidexterity?

This paper proceeds as follows. In Section 2, we review the literature on organizational ambidexterity with specific emphasis on startups’ state-of-the-art knowledge. In Section 3, we describe our research approach to study startups in the context of the entrepreneurial accelerator program “SCALEit”. In Section 4, we present our findings in terms of key competencies in startups pursuing digital innovation. In Section 5, we reflect on our findings and theorize how startups enact competencies to balance exploitation and exploration and, thus, manage ambidexterity. In Section 6, we discuss how startups pursuing digital innovation can manage ambidexterity by comparing our findings to extant literature. Finally, in Section 7, we conclude the paper.

2 Organizational Ambidexterity

To define ambidexterity, we follow Raisch and Birkinshaw (2008) who define it as “an organization’s ability to be aligned and efficient in its management of today’s business demands while simultaneously being adaptive to changes in the environment” (Raisch & Birkinshaw, 2008, p. 375). Ambidexterity requires companies to overcome the paradox of the two contradictory knowledge-processing activities exploitation and exploration (He & Wong 2004; Lubatkin et al., 2006; Raisch & Birkinshaw, 2008; Smith & Tushman, 2005). Exploitation involves a short-term, top-down learning process that leverages the routines and actions best suited for using existing knowledge and competencies. As such, exploitative activities focus on using a company’s existing strengths (Lubatkin et al., 2006; Raisch & Birkinshaw, 2008). Conversely, exploration involves a long-term, bottom-up learning process that embraces experiments and variation in pursuing innovation and that sometimes threatens the existing organizational setup and products (Lubatkin et al., 2006; O’Reilly & Tushman, 2008). Because these fundamentally different logics compete for the same scarce resources, companies experience tensions between the two (Lubatkin et al., 2006). When balancing these competing activities, prior research suggests that companies risk following their natural tendency to prioritize either exploration or exploitation, which research refers to as the “competency trap” and the “failure trap”, respectively (Lubatkin et al., 2006; Smith & Tushman, 2005). Raisch and Birkinshaw (2008, p. 377) highlight that “too much exploration may enhance a firm’s ability to renew its knowledge base but can trap organizations in an endless cycle of search and unrewarding change”. On the other hand, too much exploitation will “enable immediate profits, but foster eventual stagnation, leaving firms vulnerable to market and technological changes” (Andriopoulos & Lewis, 2009, p. 697).

Overall, the ambidexterity literature outlines three different approaches to managing the balance between exploitation and exploration (Lubatkin et al., 2006; Raisch & Birkinshaw, 2008). One approach, known as “structural ambidexterity”, describes how organizations can achieve ambidexterity through separating their efforts to focus on either exploitative or explorative activities (Andriopoulos & Lewis, 2009). In practice, they do so through either “task partitioning” (in which they delegate the different activities to different business units or work groups) or through “temporal separation” (in which they schedule the two contradictory tasks at different periods) (Adler, Goldoftas & Levine, 1999; Gibson & Birkinshaw, 2004; Andriopoulos & Lewis, 2009).

Rather than achieving ambidexterity through a predetermined structural separation of exploitation or exploration, Gibson and Birkinshaw (2004) introduce the concept of “contextual ambidexterity”. Contextual ambidexterity describes “the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit” (Gibson & Birkinshaw, 2004, p. 209). With contextual ambidexterity, the balancing of exploitation and exploration depends on the ability of an organization’s individuals to generate the proper balance themselves. Rather than having implemented formal structures that separate exploitative and exploratory activities, organizations achieve contextual ambidexterity through a supportive

organizational context that shapes rather than dictates individuals' ability "to judge for themselves how to best divide their time between the conflicting demands for exploitation and exploration" (Gibson & Birkinshaw, 2004, p. 391). Therefore, contextual ambidexterity describes how ambidextrous individuals achieve organizational ambidexterity (Gibson & Birkinshaw, 2004). Inspired by Ghoshal and Bartlett (1994), Gibson and Birkinshaw (2004) suggest that the interplay of four behavior-framing attributes—stretch, discipline, support, and trust—form such facilitating contexts and that organizations must balance the performance-management elements (discipline and stretch) with the social context elements (support and trust) in order to achieve the right supportive context (Gibson & Birkinshaw, 2004; Raisch & Birkinshaw, 2008). Additionally, a strong organizational culture, decentralization, supportive and flexible leadership, and socialization and team-building practices constitute facilitating factors (Adler, Goldoftas, & Levine, 1999; Andriopoulos & Lewis, 2009).

Finally, the third approach to ambidexterity, called "leadership-based ambidexterity", covers the pivotal role of a company's top management team in achieving ambidexterity (Raisch & Birkinshaw, 2008; Smith & Tushman, 2005). Lubatkin et al. (2006), for example, describe how behaviorally integrated top management teams with a high degree of cohesion and joint decision making have a positive effect on organizational ambidexterity. However, Gibson and Birkinshaw (2004) and Andriopoulos and Lewis (2009) describe that the contextual approach is a higher-order concept, which also spans the mechanisms of leadership-based ambidexterity.

2.1 Examining Ambidexterity in Startups

Researchers in the ambidexterity field have debated not only how companies can manage the balance between exploitation and exploration but also how to measure the extent to which organizations are ambidextrous (Lubatkin et al., 2006; He & Wong, 2004). However, rather than focusing on the extent to which startups are ambidextrous, we examine how startups manage to perform exploitative and explorative activities simultaneously and, thus, attain organizational ambidexterity. Several studies have contributed to clarifying the process of achieving ambidexterity in one or several organizations (Adler et al. 1999; Andriopoulos & Lewis, 2009; Gibson & Birkinshaw, 2004; He & Wong 2004; Smith & Tushman, 2005) However, with some notable exceptions (Beckman, 2006; Brem, 2017; Kuckertz et al., 2010; Mueller et al., 2012; Parida et al., 2016; Lubatkin et al., 2006; Volery et al., 2015), most studies have examined ambidexterity in large and well-established companies. For example, Lubatkin et al. (2006) analyzed the causality between ambidexterity and performance in small to medium-sized enterprises (SMEs) across different industries. Beckman (2006) investigated team composition and members' prior affiliations as antecedents of exploration, exploitation, and organizational ambidexterity and concluded that shared understandings from common prior company affiliations support exploitative behavior, whereas the diversity associated with different prior company affiliations encourages explorative behavior. Kuckertz et al. (2010) studied German-funded technology-oriented startups and concluded that both explorative and exploitative behavior are positively associated with innovation project success and firm performance. Brem (2017) argued that startups need to be ambidextrous "in a unique way, as they have very limited resources in all relevant areas: they need to come up with product ideas, ways of distribution, problem solving, etc., and at the same time they have to take care of legal issues, writing invoices, answering emails, etc." (p. 267). However, existing studies do not reveal how startups manage simultaneously to be creative in terms of exploration and efficient in terms of exploitation. We address this research gap in this paper. Mueller et al. (2012) investigated the everyday behavior of six entrepreneurs in the startup stage. Among other things, they looked into the time the entrepreneurs allocated to exploration and exploitation activities. They called for more empirical studies and asserted that it is both "theoretically and practically relevant to examine the nature of the entrepreneurs' behavior" with regard to "the processes of discovery, evaluation and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them" (Shane & Venkataraman, 2000, in Mueller et al., 2012, p. 1003). According to Parida et al. (2016, p. 1158), "ambidexterity is achievable in young entrepreneurial firms, it might be very challenging to create a combinatory mindset within the firm". Thus, we need more research on how to resolve these challenges. Volery et al. (2015) observed entrepreneurs and identified behavioral patterns that allowed them, their team, or the organization to pursue ambidexterity, but, contrary to their claims, they did not identify the competencies that enabled these behaviors and patterns. Cragg, Caldeira, and Ward (2011) presented a framework of organizational IS competencies in SMEs that comprised 22 IS competencies organized around six macro competencies. However, although the framework unites previous frameworks and typologies of IS resources and competencies, the competencies refer to specific abilities at the organizational rather than the individual level. Thus, we lack state-of-the-art knowledge about the individual-level competencies that

startups require for ambidextrous behavior. Furthermore, despite these valuable contributions, we know about no research that has investigated ambidexterity in startups pursuing digital innovation.

To investigate how startups manage ambidexterity, we need to understand the nature of the explorative and exploitative activities they perform. As we state above, startups constitute companies searching for a repeatable and scalable business model (Blank & Dorf, 2012). Thus, explorative activities include performing experiments to achieve a product/market fit, engaging with users to explore new revenue streams, searching for capital and funding, acquiring knowledge of new technologies, and innovating products and business processes (Volery et al., 2015). On the contrary, exploitation in a startup includes the performance of daily operations, administration, accounting, system maintenance, repeated sales to existing customers, incremental product development, and overall efficiency improvements (Volery et al., 2015).

In examining ambidexterity in SMEs, Lubatkin et al. (2006) emphasize that SMEs lack the option of managing ambidexterity through structurally separating activities because they lack organizational structures and have limited resources. We argue that startups have similar organizational constraints and, therefore, lack the option of structural ambidexterity. Having eliminated the structural option, Lubatkin et al. (2006) examine ambidexterity in SMEs by studying the facilitating role of top management teams. In this regard, we argue that startups are too small and undefined to contain an actual top management level and, therefore, also lack the option of leadership-based ambidexterity. Accordingly, based on the three general approaches to ambidexterity that the literature outlines (Raisch & Birkinshaw, 2008), startups only have the option of attaining ambidexterity through the contextual approach according to which they create a context that allows individuals in the startup to judge for themselves how to divide their time between exploitative and explorative activities (Gibson & Birkinshaw, 2004). Startups are “embryonic” organizations (i.e., organizations in the making). As such, it makes sense to focus on the activities of individuals that make up these organizations at their earliest developmental stages.

When examining what makes an individual ambidextrous, Raisch, Birkinshaw, Probst, and Tushman (2009) suggest exploring the individual's personal characteristics including their competencies and further emphasize that one should consider personal characteristics alongside the organizational context that supports ambidextrous behavior. Assessing the competencies that individuals use in startups pursuing digital innovation would imply mapping the competencies in an information systems (IS) and innovation management context. Several studies quoted in the IS and innovation literature have used Feeny and Willcocks' (1998a, 1998b) framework to map and examine the impact of IS competencies on process innovation, firm performance, and new product development (Pavlou & Sawy, 2006; Preppard & Ward, 2004; Ravichandran & Lertwongsatien, 2005; Tarafdar & Gordon, 2007). Consequently, we draw on Feeny and Willcocks' (1998a, 1998b) studies in which they develop nine core IS capabilities to define the term competency. They define a competency as “a generic unit of ability such as ‘analytical thinking’, ‘self-control’, or ‘results orientation’” (Feeny & Willcocks, 1998a, p. 16). One can attribute this focus on the individual to the conceptualization of competency in psychology as “an organism's capacity to interact effectively with its environment” (White, 1959, p. 297). Feeny and Willcocks (1998b) further elaborate that such competencies imply a set of individual behaviors, personalities, and skills. The way we use the word competency aligns with that the way that the management literature often uses it: as “an underlying character of a person in that it may be a motive, trait, skill, aspect of one's self-image or social role, or a body of knowledge which he or she uses” (Boyatzis, 1982, p. 21). Our distinction between competency and competency portfolio resembles that of Stratman and Roth (2002) who define and operationalize the concept of ERP competence “as a portfolio of managerial, technical and organizational skills and expertise” (Stratman & Roth, 2002, p. 602). In Table 1, we list definitions of key concepts we use in this paper.

Peppard and Ward (2004), using the framework of Feeny and Willcocks (1998a), describe how competencies are embedded in and linked to organizational processes and routines. Thus, “a competence is an emergent property of organizational processes” (Peppard & Ward, 2004, p. 180), and the manifestation of one competency depends on the context and task at hand. Therefore, by nature, a competency is neutral and cannot be defined as either exploitative or explorative. Instead, enacting a competency in performing a particular task in a specific context determines whether it is exploitative or explorative (Volery et al., 2015). Accordingly, examining ambidexterity in startups implies an integrated analysis that covers the competencies of the individuals in startups and the context that facilitates individuals' actions.

Table 1. Definitions of Key Concepts

Concept	Definition
Competency	Generic unit of ability constituted by a set of individual behaviors, personalities, and skills (Boyatzis, 1982; Feeny & Willcocks, 1998a, 1998b).
Key competency	A competency that must be available either inside the startup or externally through stakeholders in order to perform core business activities (adapted from Prahalad & Hamel, 1990).
Competency portfolio	A bundle of key competencies that the startup can access (Stratman & Roth, 2002).
Competency enactment	The process of putting competencies to use (Raisch & Birkinshaw, 2008).
Role	Formal task responsibility in the organization (Krantz & Maltz, 1997).
Resource	Stocks of available factors that the startup owns or controls (Peppard & Ward, 2004).
Task	A unit of activity that is either explorative or exploitative depending on purpose and context (Volery et al., 2015).
Startup team member	An individual who is part of the startup team.
External stakeholder	An individual or organization outside the startup.

3 Research Design

Previous research of contextual ambidexterity primarily relies on quantitative studies (Du et al., 2013). However, our research question, which focuses on how startups manage ambidexterity in pursuing digital innovation, leans itself toward a qualitative case study since case studies constitute the most appropriate foundation for answering “how” questions (Huang & Kim, 2013). Furthermore, Raisch and Birkinshaw (2008) emphasize the need for detailed case studies to further substantiate our knowledge about contextual ambidexterity at an individual level of analysis, and we focus on doing so by examining the competencies that individuals that constitute startups need. Therefore, we contribute a qualitative multiple case study that examines contextual ambidexterity in startups to the ambidexterity literature (Miles & Huberman, 1994). Specifically, we examined seven startups that participated in the SCALEit accelerator program (see below). However, we did not focus on SCALEit itself in our investigation. Rather, SCALEit served as the context of our investigation and provided us with access to the startups. Thus, our study corresponds to a holistic, multiple case study rather than an embedded case study (Yin, 2009). Our research builds on extensive interviews across seven startups and three startup investors and on field observations of a group of entrepreneurs that participated in SCALEit, which focuses on helping Danish entrepreneurs scale and accelerate their business in the United States (US). We organized our qualitative study based on Miles and Huberman's (1994) recommendations regarding instrumentation, data collection, data analysis, and data display.

3.1 The Analytical Framework

As we state above, in this paper, we assess the combination of competencies that startups pursuing digital innovation require to attain ambidexterity. Accordingly, we chose to base our study of competencies in startups on the research framework that Feeny and Willcocks (1998a, 1998b) present. We chose Feeny and Willcocks' (1998a) nine core IS capabilities framework for several reasons. First, it has received a high number of citations (1200+ citations according to Google Scholar at the time of writing) across many different IS studies. Second, the framework pertains to our research since it draws attention to competencies “needed to facilitate the exploitation of IT, measurable in terms of IT activities supported, and resulting business performance” (Willcocks & Feeny, 2006, p. 49). In their work, Feeny and Willcocks (1998a, 1998b) examine the multiple competencies and skill sets that enable organizations to successfully manage the supply and demand for IS/IT services. In doing so, they present a framework that taps into three streams of research that explores the core IS competencies that IT organizations need. The first research stream explores CIOs' competencies, which, in the startup context, corresponds to CEOs' role, persona, and experiences. As such, we chose to interview all CEOs from the seven startups that participated in our study. The second stream investigates in-house competencies, which, in the startup context, corresponds to the competencies in each startup. Furthermore, the second stream explores the development and access to those competencies, profiles the individuals that deliver them, and, thereby explores the context in which organizations leverage the competencies (Raisch & Birkinshaw, 2008). Thus, we examined these competencies in our study. Lastly, the third research stream investigates outsourced IS/IT competencies, which, in the startup context,

corresponds to startups' experience with both insourcing and outsourcing. Thus, we examined startups' experience in assessing their internal competencies versus the competencies that external parties possess. Consequently, by following Feeny and Willcocks' (1998a, 1998b) framework, we conducted an integrated study that covered both the individuals' competencies and the context that shaped their actions.

3.2 Case Description

We conducted our observations and interviews during a one-week accelerator program called SCALEit that targets Danish entrepreneurs who work with digital innovation (SCALEit, 2015). The Innovation Centre Denmark in Silicon Valley (a branch of the Danish Government founded as a partnership between the Ministry of Higher Education and Science and Ministry of Foreign Affairs of Denmark) conducts the SCALEit program. Innovation Centre Denmark offers several services that help Danish companies to “navigate in disruptive markets and technologies by connecting [them] to world-class knowledge institutions, investors and partners” (Innovation Centre Denmark, 2015). As part of its services, Innovation Centre Denmark runs the SCALEit program as a growth initiative that helps Danish technology companies scale globally “by offering a unique opportunity to interact with the high-speed and innovative Silicon Valley ecosystem” (Nielsen, 2017). The program targets Danish entrepreneurs who wish to gain inspiration and learn how to scale and accelerate their startups using Silicon Valley as a point of entry. Through Innovation Centre Denmark, we gained access to participate in an entire SCALEit program and, thus, to observe the program and the four participating startups. Furthermore, by following the SCALEit program, we came into contact with three additional startups and three startup investors. In addition to our SCALEit observations, we conducted interviews with the seven startups and three startup investors.

We examined startups that participated in the SCALEit program since they focused on scaling their business internationally and considered themselves as global businesses pursuing digital innovation in hypercompetitive markets. Accordingly, these startups experienced the challenges that we present in Section 1, which means that they needed to master ambidexterity to ensure they survive in the global market. All startups that participated in this study worked with digital innovation in the sense that they had a business model embodied by IT. They primarily offered software products, although some also involved hardware elements. The startups relied on a mixture of business-to-consumer and business-to-business business models. We found no correlation between hardware or software products and business model in the startups, and they had different ages (from one to four years). Additionally, some of the startups generated revenue and some did not. However, they had all launched a product or service and wanted to upscale their startup to a global business. The seven startups in this study focused on a wide variety of digital technologies (see Table 2 for an overview): 1) an app that connects people who need assistance with volunteer helpers, 2) a smart and connected toy that uses data to assess cognitive development, 3) an app-connected moneybox for educational purposes, 4) an app that connects and facilitates social events between people, 5) a Web platform that brings freelancers and clients together, 6) a cloud-based product information-management system, and 7) a blood-analysis device for improving women's health. The three investors interviewed in this study had different characteristics: one was a venture capitalist, one a partner in a startup accelerator, and the last an angel investor. The concentration of venture capital, angel investors, and startup accelerators in Silicon Valley is higher than anywhere else in the world, and Silicon Valley currently accounts for more than 40 percent of venture capital invested in the US (CBInsights, 2015), which makes its ecosystem a favorable environment for startups that seek funding to scale their business.

3.3 Data Collection

We gathered data over a three-month period. Our primary data comprised observations and ten semi-structured interviews that each lasted approximately one hour and all followed the same interview guide (Miles & Huberman, 1994). We conducted interviews with three investors and seven digital innovation startups. See Table 2 for an overview of the participating informants and their respective roles. Additionally, we transcribed all of the interviews, which resulted in more than 200 pages of text (Miles & Huberman, 1994).

Table 1. Informant Overview

Informant	Company product / service	Roles
1	An app that connects people who need assistance with volunteer helpers	CEO
2	A smart and connected toy that uses data to assess cognitive development	CEO
3	An app-connected moneybox for educational purposes	CEO, CIO, CMO
4	An app that connects and facilitates social events between people	CEO
5	A Web platform that brings freelancers and clients together	CEO
6	A cloud-based product information management system	CEO, CTO
7	A blood-analysis device for improving women's health	CTO
8	Venture capitalist	Partner
9	Startup accelerator	Partner and investor
10	Angel investment company	Angel investor

Furthermore, we conducted 30 hours of descriptive observation not to answer a particular question but rather to try to understand “what’s going on here?” (Spradley, 1980). Spradley (1980), with his ethnographic approach to descriptive observations as a way of identifying the features of a phenomenon in a social setting, served as inspiration for this effort, which resulted in our using his “grand tour observations” and “mini-tour observations” (Spradley, 1980). Specifically, we first observed the overall context that comprised our field of observation (i.e., the one-week SCALEit program) and then focused more narrowly on the startups. In other words, we compiled the bigger picture (i.e., the grand tour) by observing the SCALEit program from which we obtained valuable background information that we used as a foundation to narrow examine the individual startups (i.e., the mini tour). The grand tour information included:

- Introduction to the Silicon Valley ecosystem
- Practice of pitching business concepts with feedback from a pitching professional
- Multiple pitch sessions with potential investors and partners
- Lessons learned from other Danish entrepreneurs who have established and scaled their startup in the USA
- Networking with other international entrepreneurs, and
- Legal counseling.

Synthesizing the insights from the grand and mini-tour observations, we gained a priori knowledge that we used in creating the interview guide. Furthermore, the observational data served as a foundation for comparing and validating the informants’ statements in the interviews.

We wrote up the raw field notes from our observations and recorded and transcribed the interviews. Subsequently, we coded each data entity separately using the qualitative data analysis software NVivo (Miles & Huberman, 1994).

3.4 Data Analysis

Miles and Huberman (1994) describe how working with empirical data implies that one needs to thoroughly consider how collects, analyzes, and displays it. Drawing on our comprehensive transcription and comparison of the interviews and the field notes from the observations, we began an iterative coding process that comprised three main iterations in which we analyzed and synthesized both theory and our qualitative data.

3.4.1 Stage One: Identifying Initial Categories in the Literature

By searching the Scopus and Web of Science citation databases for relevant literature using keywords associated with ambidexterity and innovation, we gained a foundation for understanding the subject area of ambidexterity as a basis for defining key competencies in startups pursuing digital innovation. We followed a similar approach to Stratman and Roth (2002) who, by identifying theoretically important competency constructs, defined and operationalized ERP competence. The literature search yielded papers that we subsequently categorized according to themes (e.g., exploitation, exploration, and structural ambidexterity).

As a result, we identified 40 categories across all papers. Subsequently, we evaluated papers' relevance by relating the categories (i.e., the themes) to our research question, which resulted in our merging some categories and discarding other since they lacked relevance to our study. In the end, we included papers across 20 categories that spanned key themes related to ambidexterity and innovation. As a result, we came to better understand the ambidexterity literature (i.e., we developed priori knowledge), which influenced how we collected our empirical data. In addition, we performed a similar search for literature that covered competency theory and, as we mention above, selected Feeny and Willcocks' framework (1998a, 1998b) as the basis for our research and competency definition.

3.4.2 Stage Two: Identifying Initial Categories in the Empirical Data

We loaded all transcribed interviews and write-ups of observational data into NVivo for separate data analysis before we conducted a more holistic analysis in which we searched for patterns across the data set. We followed Miles and Huberman (1994) in carrying out "first-level coding" on each data entity by categorizing data based on themes that appeared naturally in the data. This coding process resulted in a total of 165 data categories, such as personality traits, collaboration process, investor collaboration, pitching, technical tasks, and prioritization of tasks.

3.4.3 Stage Three: Coding the Empirical Data Using the Literature

After stage two, we performed "pattern coding" in which we related the categories to themes and concepts that we defined in stage one. As Miles and Huberman (1994) recommend, we followed an iterative process to pattern coding whereby we related the categories to themes and concepts as we collected and, subsequently, analyzed data. Consequently, the categorization of the ambidexterity literature provided guidance for the pattern coding in the sense that we organized our data around the themes in the literature (e.g., we grouped data that matched the attributes of the facilitating organizational context). We followed the same process to categorize the data according to the competency literature, which influenced how we grouped data around personality traits, skills, and types of tasks that we found in our interviews and observations. Finally, the pattern coding followed Feeny and Willcocks' (1998a, 1998b) research framework; as a result, we generated the categories of CEO, startup team, and Silicon Valley ecosystem that contained data that described the individuals that corresponded to these three categories. In total, our pattern coding resulted in our reducing the number of categories from 165 to five (i.e., competencies, CEO, startup team, Silicon Valley ecosystem, and context). Table 3 provides an overview of the final categories and corresponding numbers of subcategories. We further decompose some of the subcategories in Table 3 into an additional level of subcategories, which explains why the number of subcategories in the table does not total 165.

Table 3. Data Categories and Subcategories

Category	Subcategories
Competencies	Thirty-three subcategories (e.g., "design tasks", "impulsive", "technical tasks", and "energetic").
CEO	Two subcategories ("CEO tasks" and "CEO role").
Startup team	Six subcategories (e.g., "establishing the team", "hiring team members", and "team composition").
Silicon Valley ecosystem	Eight subcategories (e.g., "investors", "external advisors", and "SCALEit").
Context	Twenty-two subcategories (e.g., "decision-making process", "company culture", and "trust").

4 Key Competencies in Startups

Through the three data-analysis stages that we mention above, we identified eight key competencies (digital product development, enterprising, envisioning, business orchestration, commercialization, networking, empowerment, and perseverance) in startups pursuing digital innovation. In line with Stratman and Roth (2002) who define and operationalize ERP competence, the eight key competencies identified constitute a competency portfolio through which startups can achieve ambidexterity by enacting the competencies to perform explorative and exploitative tasks (Volery et al., 2015). Figure 1 illustrates the competencies, and we describe them below in terms of the behavior, personality traits, and skills that they entail (Feeny & Willcocks, 1998b).

After presenting the eight competencies, we map the combination of competencies that the CEO, the startup team members, and external stakeholders in the startup ecosystem of Silicon Valley enacted. In practice, this process involves enacting a competency portfolio that crosses organizational boundaries.

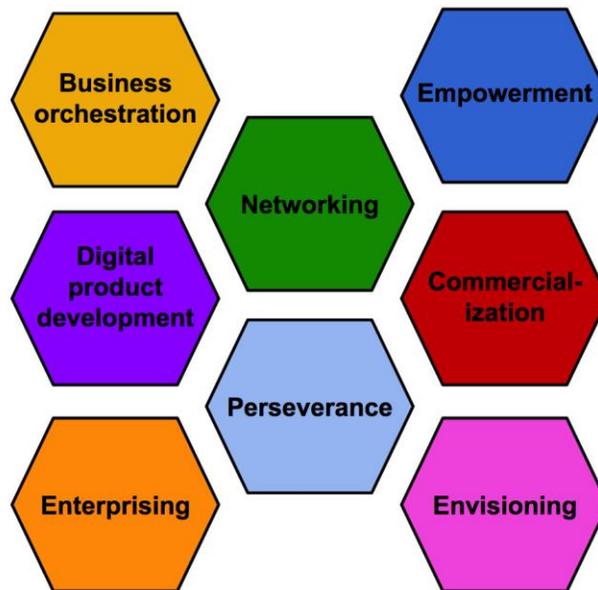


Figure 1. Key Competencies in Startups

4.1 Digital Product Development

The ability to transform a vision into an actual digital product represents the essence of the digital product development competency. As we mention in Section 3.2, all the startups we examined had a software element. Therefore, for these startups, building an actual product meant that they required individuals who had mastered programming to develop the software as one team member highlighted: “If you are creating an IT company, one of the team members has to be a programmer”. Building hardware components is also an expression of the digital product development competency even though it implies different behaviors and concerns as one team member stressed: “Hardware is different from software. It is much more complex, and you also have to consider supply chain and stuff like that.”. Furthermore, the competency of digital product development also entails the concerns of product design (i.e., concerns related to “design thinking, design abnormality, design ethnography, and user-centered design” as one CEO noted). Thus, digital product development requires both technical and managerial skills (e.g., a programmer’s and a designer’s or architect’s skills). Another startup team member explained how behavior related to the competency of transforming the vision into an actual product also implies coordination and collaboration:

I have technical insight, and I am able to scope, that is describe a solution to a development team, do pricing, and start and manage a production as well as ensure that they do what they are supposed to do, at the right price, at the right time, and with the right quality. That is basically what I am good at.

Startups pursuing digital innovation need to build the product and make technology work since invention and creation are necessary but not sufficient prerequisites for innovation. As one CEO emphasized:

The value is in the product, or, as long as you have a good idea, and that product/market fit works, then it’s all about the product. And you have to build it; otherwise you will not receive any feedback telling you if you are doing the right thing.

The individuals who embody the digital product development competency have a natural inclination or urge to design and create. They enjoy solving technical challenges and the feedback they receive when building yet another part of the product as one startup team member explained: “Sometimes I forget to consider our guidelines and visions, because I just want to create the coolest thing that can ever be done”. Finally, this

quote also exemplifies how the digital product development competency entails immersion into the details and intricacies of the scrutinized subject area.

4.2 Enterprising

Another key competency in startups pursuing digital innovation concerns the ability to execute any task and get things done. Consequently, we call this competency enterprising. This competency entails the personality trait of having a “frenetic energy level” as one investor called it. For example, one team member explained: “The journey from thought to action is short. I do not have a need to sit down, think and analyze. If it makes sense, I will do it right away.”. This energetic behavior constitutes an essential element in the enterprising competency. One CEO noted: “So it is probably a curse, but I don’t like sitting on my hands” and “I will never sit back and relax, never”.

Startups have no time for hesitation due to their scarce resources, which makes enterprising an important competency for them. We observed individuals who displayed this competency as self-reliant problem solvers who possessed discernment and decisiveness. For example, one investor said: “But I have always been of the view that if there is a problem, it will get solved—and I will get it done. And that has always been that way.”. Thus, enterprising often involves the courage to take on tasks in unknown areas of expertise. One startup team member explained:

We face hurdles all the time and face things that we do not know anything about. Then it is just about figuring it out as quickly as possible, and then move on. We cannot hire anyone to figure it out for us, so it is just the hard way. The fun way! You learn a lot from that.

This quote also demonstrates how the enterprising competency implies an iterative learning-by-doing work process whereby individuals acquire new knowledge and skills on an ad hoc basis. As one investor said: “My background is completely self-taught, I dropped out of high school and out of college. And I basically taught myself marketing because I had a business I wanted to grow and I didn’t have any money”. Further, one CEO explained: “We first figured out all of those things afterwards. We should have known it from the beginning. We did not. We were just in execution-mode. So, we had to say—we need to go back and get the basics straight.”

The energetic behavior and learning-by-doing approach to problem solving that the enterprising competency implies enables startups to pivot and adapt their business in searching for a scalable and repeatable business model.

4.3 Envisioning

Startups pursuing digital innovation need the envisioning competency in order to create new and original concepts and, thus, develop new products and services. This competency entails a never-ending stream of ideas on how to improve, optimize, and create new products and services and, as one CEO explained: “At the end of the day, it is just about solving problems, or identifying problems and being able to execute it right”. However, our research shows that this competency is linked to the entrepreneur’s desire to inspire people and make the world a better or smarter place. As an example, one team member described the purpose of their innovation: “You know, it is something that would improve [users’] life quality”. Indeed, an investor backed this thought in explaining the vision of a CEO in a startup he recently invested in: “He is doing this because he believes that he can help a lot of people around the world”. Additionally, one investor defined passion as an important trait of the envisioning competency:

It’s like you are passionate because of life experience or you have worked somewhere and had a pain point, like this sucks and I have built a whole business around it. I don’t want people to go through what I went through when I was doing that in my last company.

Furthermore, our observations show that envisioning entails the skills creativity and design thinking and involves looking at the big picture and avoiding too many details. Likewise, it entails idealism that future goals and benefits drive as one team member explained: “You know, you have that dream in front of you. We just have to reach that point, we just need to do this and that.”. Finally, individuals who display the envisioning competency are independent, take risks, and embrace the unorthodox and unexplored in generating concepts. Indeed, a CEO indicated as much in explaining that: “Through a personality test, I became aware of how little I respect rules and standards”.

4.4 Business Orchestration

Business orchestration concerns executing day-to-day activities and managing business processes. Thus, metaphorically speaking, business orchestration involves making the wheels turn and ensuring a solid foundation for doing business. Hence, according to one CEO, individuals require this competency in performing traditional finance-related tasks such as “making financial models, reading financial statements, making statistics, and understanding numbers and financial structure in general”. Furthermore, startups need to secure a stable cash flow to build a sustainable business foundation as another CEO stressed: “I know exactly when our money will run out, and based on that I know that if I am not getting some [money] before that, then we will run out, and then we won't have a secure foundation”. Therefore, fundraising, including talking to investors and attending investor meetings, also represents an example of enacting the business orchestration competency. Moreover, business orchestration involves handling legal concerns regarding ownership, patents, how to move the company onto the global business scene, and so on. As one team member noted, individuals who excel at business orchestration are skilled at “structuring things, making time schedules, meeting deadlines, and ensuring progress of a process”. In summary, enacting the business orchestration competency involves a wide variety of tasks—from mitigating risks to designing business processes.

4.5 Commercialization

While the digital product development competency embeds the ability to transform a vision into an actual product, the commercialization competency involves transforming an idea for a product or service into a business opportunity. In turn, doing so requires communicating the value of the product or service to customers. Thus, commercialization relates to marketing and PR. However, one investor highlighted how he saw the marketing trait of the commercialization competency only in 50 percent of digital startups even though it is key to successfully commercializing products or services of startups: “We do like to see people that understand marketing, but I would say that it's less than half”. Moreover, the investor emphasized marketing's value in noting that he actively sought to teach the startups he invested in marketing if they did not possess this skill from the outset. Enacting the commercialization competency requires skills associated with being a “people person”. As one CEO explained:

I am good...at reading the situation. Quickly assessing what angle you might have on all this. What game you are playing, and how I can either play along or make you think that I do, thus making you believe that this is happening with the best intentions in mind.

Accordingly, a personality trait of the commercialization competency involves the ability to tailor communication about a product to a given sales situation, which implies the ability to perceive and understand how to best approach stakeholders when having to achieve an intended outcome.

4.6 Networking

As with the commercialization competency, startups who have individuals with traits associated with an outgoing personality allow the startups to leverage the network competency. Therefore, the characteristics of the networking competency focus on three activities: meeting, sharing, and recalling. Meeting other people and learning from them represent an essential part of the competency. This willingness to learn from others relates to the realization of one's own limitations and lack of knowledge as a basis for actively searching for insight and input from others. As one team member explained: “If there is something technical that I need an answer to..., then I will ask some über-technical person who I, of course, have in my network”. The networking competency entails an active engagement with connections in the existing network as one CEO described: “Every time we make a decision we have a lot of insights internally in the founding team, but we also ask our advisory network afterwards to get other interesting in-sights and inputs”. Networking concerns knowing who in the network to turn to for help in order to solve immediate problems or address current issues based on past experiences and relevant knowledge.

Startups leverage networking for not only learning purposes but also giving back. This competency is typically found in conjunction with an attentive personality such that it tends to make other people that a networking person connects with or encounters feel at ease sharing their activities and potential problems because they believe that the networker has their best interest in mind and wants to help them in any possible way. An investor expressed the fact that this competency also implies the intention to help others in the network in the following quote: “When the CEO said: ‘Oh, I'll need a marketing person’, then I say: ‘Oh, I know just the person’. ‘Oh, I need a VP of engineering’, and then I say: ‘Yup, I know that person too’.”.

Accordingly, the networking competency features the ability to recall people that one has previously encountered who could offer a solution to the expressed challenges. Consequently, a good memory and the ability to think in patterns also represent personality traits associated with this competency.

4.7 Empowerment

A startup requires the empowerment competency to use and realize the full potential of its scarce human resources. One CEO described how to encourage team members to share their potential challenges in saying that he would ask them “What do you need, how can I help so that you can do your work better?” so that they could proactively deal with any issues and not endanger the progress of establishing a scalable and repeatable business model. The empowerment competency concerns not only proactive but also reactive problem solving. For instance, one team member explained how he assisted other startup team members by introducing them to individuals in his network if they needed help solving a problem that they could not solve themselves.

Furthermore, the empowerment competency entails the ability to appreciate joint decision making and work delegation and, thus, to let other team members be in charge. As one CEO explained: “We sort out the objectives [together], what we want to obtain, and what is important..., and then we decide on an abstract level. But from there people themselves are in charge of executing.”. This competency includes not only the ability to delegate but also the virtue of trust. The CEO continued: “If there is anyone taking the lead, then I trust them to do it. I do not have a need to control.”. Additionally, delegating work and trusting fellow members with responsibility reveals a trait of respect for others and their proficiencies as an element of the empowerment competency.

4.8 Perseverance

Both entrepreneurs and investors highlighted persistence as a key competency in startups. One investor explained: “The thing that I try to look for is that tenacity. ...You know the view that you are not going to lose. Whatever it takes you are going to win.”. Therefore, we can explain this conviction of future success as a paramount belief not in a specific product or idea but in the ability to make the startup work—to find something that will ultimately work because one has a passion for doing so. Another investor outlined why startups need individuals with the perseverance competency:

The truth of the matter is that, in startups, ...you have to pivot. So, let's say you guys start a company and a year goes by, and this looks really tough. You could say, 'you know, we give up. ...This is not going to happen.'. But if you guys are tenacious and tough, you are going to say: 'Yeah, this didn't work out, but you know what—we are going to get it done'.

Consequently, perseverance allows a startup to search for a repeatable and scalable business model.

Experiencing challenges and setbacks is an inevitable part of startup life, but the perseverance competency determines how startups react to setbacks. One CEO described how his startup team tried to proactively cope with obstacles: “There is nothing that we sit around waiting for. We always have something to fall back on if the answer is ‘yes’ or ‘no’. We never depend on only one thing.”. Despite mastering the competency of perseverance, one CEO explained that he understandably felt down having invested a lot of time in a project that turned out badly, but that he gets over it after a short while. Another startup team member explains:

You live with an indomitable belief that you can make it work, and that you will never give up. Believing that makes you able to handle setbacks with a shrug: Oh, you know that is quite funny, or that will maybe become a funny story one day, or I think that I am just going to forget that.

Consequently, the optimistic personality trait constitutes a fundamental aspect of the perseverance competency. Table 4 summarizes the eight key competencies we identified in our study.

Table 4. Key Competencies in Ambidexterity

Competency	Ability to
Digital product development	Transform a vision or an idea into an actual product
Enterprising	Perform any task that presents itself and handle challenges
Envisioning	Create new and original concepts
Business orchestration	Execute day-to-day activities and design business processes
Commercialization	Transform a product or service into a business opportunity
Networking	Connect, make an impression, and create relationships with external stakeholders
Empowerment	Utilize and realize the full potential of the scarce resources available in the startup
Perseverance	Keep working despite obstacles

4.9 Competencies of the CEO

Throughout this study, CEOs showed themselves to be generalists in that they took care of a wide variety of tasks in their startups. As one CEO noted: “I am really a jack of all trades. I have done sales, I have done marketing, I have been programming, I have been presenting, and I have been writing applications.”. However, the interviews highlighted three main tasks that the CEOs performed, which one informant summarized as: “Making sure that we do not run out of money, hiring amazing people, who are more talented than me, and then for the rest of it staying out of their work and really giving them the freedom to conduct it.”.

While startups often use bootstrapping (i.e., self-financing) as a financial model, they eventually need to obtain external funding to continue their work on finding a product/market fit. Our research shows that a startup’s CEO deals with the challenge of attracting capital, which typically takes place through pitching the business idea to potential investors. From observing the SCALEit program, we found that the act of pitching relies on enacting the business orchestration, networking, envisioning, and enterprising competencies. In pitching, startups leverage the business orchestration competency to present the financial opportunities related to the future of the business and to describe the state of the startup through extensive insight into company metrics. Furthermore, one interviewed investor explained that investors often have their preferred business areas that they invest in. Thus, the networking competency ensures startups can establish contact to potential interested investors. One investor explained how pitching also relies on the envisioning competency since investors consider passion a more reliable foundation for establishing a business than just wanting to earn money. The investor explained it as follows:

It's like you are passionate because of life experience or you've worked some-where and had a pain point like: 'This sucks and I've built a whole business around it'. 'I don't want people to go through what I went through when I was doing that in my last company'. So, those are better approaches to come at.

Moreover, a CEO described how an unsuccessful meeting with an investor made him realize that his startup team lacked knowledge about business fundamentals: “That was a wake-up call—that maybe we had to go home and do some studying”. This way of dealing with setbacks reveals the CEO enacted the perseverance and enterprising competencies since he practiced learning by doing and, at the same time, behaved optimistically with regard to accepting and learning the things he did not know.

Both CEOs and investors described how startups often hired new team members based on recommendations from the network, which again emphasizes the essential networking competency. Hiring the wrong people can devastate startups due to their scarce resources. One investor highlighted the fact that hiring focuses on mitigating risks:

You sort of like hire slow, fire fast. You take a lot of time to get to know someone. I love 'try before you buy'. If we're going to work together, I'm going to hire you as a consultant for three months and I'm going to get to know you in those three months before I make a full-time offer.

Therefore, being able to evaluate whether or not a new hire could valuably extend a startup’s team involves the envisioning and enterprising competencies.

Our research shows that CEOs enacted the empowerment competency to realize the full potential of their team members. One CEO explained: “When I came into the team there they were blown away that they had freedom to create, but you know that's the whole point of startups! You empower people to create something that you don't know.”. Another CEO who stressed that he simply had no time for micro-management further noted that he motivated team members to make choices for themselves. Moreover, the startup CEOs' enacting the empowerment competency implied a joint decision-making process: “We have the rule, that the one with the best arguments gets to decide. Sometimes it comes to a deadlock with the ‘I want’ and ‘I want’. But I think that we are good at deciding things together.”. Another CEO explained how joint decision making through frequent debates actually enabled a startup to appear carefully thought out:

As a startup you are constantly challenged on your direction, your models, and your vision. ...So, when we have been de-bating, then we also have the arguments supporting the decision that we ended up making, due to the fact that we have already discussed it.

4.10 Competencies of Startup Team Members

When examining the team members that constituted the startups that we examined, we explored the combination of in-house competencies that the team members enacted. One CEO described the minimum in-house competencies that a startup needs as follows: “At a minimum, the startups must be able to build the product themselves, and at a minimum they must consist of one outgoing person who's able to talk to people”. Our research shows that all startups displayed this in-house access to the digital product development and networking competencies. The need for these two particular competencies relates to the fact that startups that deal with digital innovation focus on searching for a product/market fit. One investor explained: “If the product is not good enough and it doesn't fit, then there's nothing. In my world, it's really a myth that you can sell bad software if you just work hard enough.”. Consequently, by iteratively building their product and receiving feedback from talking to potential customers, the startups in our study developed and adapted their business. In addition to digital product development and networking, the startups needed the enterprising competency since achieving the right product/market fit involves quickly testing ideas and prototypes. While the CEOs displayed the business orchestration competency, the team members in charge of marketing, PR, and product sales displayed the commercialization competency. However, some of the startups in our study completely lacked the commercialization competency in house due to either outsourcing or their struggle with achieving a product/market fit, which meant they were not yet ready to market their product.

Furthermore, the startup team members differed from the CEOs in the sense that they were professional specialists who often excelled in just one skill (e.g., a particular programming language, user experience, or online marketing). One CEO explained the need for hiring specialists as follows: We don't need another generalist...because that is two chiefs trying to do the same thing”. We found a clear division of work and responsibility between these specialists that constituted the startups. As one team member highlighted: “We have a clear division of responsibility”. One CEO further said:

I have the responsibility for legal [matters] in our business, and thus I have to figure that out. Now we have a thing about owner agreements, which is also legal stuff, and we know nothing about that. Therefore, I will have to ask our network. But it is my responsibility to present some material, and then together we can all say: “Alright, let's do that”.

Therefore, this division of work and responsibility between team members implies that they needed the networking and enterprising competencies in order to access the knowledge and competencies of individuals outside the startup. Doing whatever it takes to fulfill the delegated responsibility implies a certain amount of self-discipline. One team member explained: “You cannot say: ‘I don't know’. Then you will have to figure it out.”.

A well-functioning startup team involves than just a mix of individuals who contribute with their expert skills. Because the area of digital innovation implies high uncertainty and rapid change, the startups needed to build an “A-team” that displayed the perseverance competency, appreciated the value of constant learning, kept up the spirit, and never gave up. The startups considered having an “A team” as more valuable than having an excellent idea since they can change the idea and acquire new professional skills along the way. However, as one CEO claimed: “An A-team does not build itself if people don't have the capability”. Therefore, when building the startup team, we see that startups searched for employees who possessed the same sort of passion and drive that initially made the founders create the business. As one CEO stressed: “You are not supposed to be here for the money. Instead you need to have that passion that

everyone's talking about." Another CEO agreed: "The most important thing is to employ people who understand and accept our vision". As such, the envisioning competency plays a vital role in ensuring a startup acquires the necessary team members. The expectation that startup team members should enact the envisioning competency also relates to an implicit expectation that they should be ambitious and, thus, emphasizes the importance of the enterprising and perseverance competencies. Indeed, one CEO said: "The more we are able to push each other and really find out what is counting, the better we can become".

Finally, both CEOs and investors emphasized the importance of getting along and having a strong company culture. One CEO stated:

One thing is how good the product will become, another thing is the journey. I have seen in my last company, what a bad company culture can do to you. It can really be fatal. ...So, it is very important that we fit together at a personal level.

Another CEO described how hanging out with potential candidates, spending an afternoon watching a football match with them, or doing some other similar activity with them provided one way to assess their personality fit before hiring them. Finally, one investor described the chemistry as follows: "It should be like a happy marriage, where you can complete each other's sentences, and you are obviously in harmony". Accordingly, chemistry and cohesion among a startup's team members represent important factors in helping the startup to succeed due to the extensive time they spend together.

4.11 Competencies in the Startup Ecosystem

In examining the combination of internal and external competencies that startups dealing with digital innovation enacted, we found that individuals in the surrounding ecosystem of Silicon Valley provided several such competencies. First of all, startups need to have an advisory board as one of the experts during the SCALEit program emphasized: "You need an advisory board for two reasons. You need new knowledge to supplement what you already know, and you need to prove to potential investors that you are aware of your own limitations and are willing to learn.". Therefore, the startups in our study either had an advisory board or had begun to build one.

Moreover, when startups raise the first round of money in exchange for equity, they gain access to the extensive knowledge and competencies of their investors. One investor explained:

Startups are really high risk. How are you going to reduce the risk? You do the same thing in parenting. Which is you give help. ...So, if we invested in you, there is literally nothing I would not do to help you guys succeed.

This form of help spans from just giving advice to contributing to actual work tasks to even temporarily working in the startup. The same investor elaborated:

I'll be at your board meetings; I'll give you my thoughts etcetera. Help you get co-investors into your deal. That is the very minimum. But going forward, you know, we have had portfolio companies saying: 'You know, we are a bunch of engineers, we need to write some marketing copy, and none of us writes very well. Can you write it, because you understand what we are doing?'. So, I have written that.

Accordingly, this quote expresses how the investor contributed to the startup with the commercialization competency, which enabled it to articulate its product in writing, and the networking competency, which enabled the startup to gain more investments. Another investor explained how he contributes with the business orchestration competency as follows:

I spent last week together with one startup CEO and made a financial model... So, we sit down for one day and think it through—if this is our goals for 2016 and 2017, who do we need to hire, in what pace, and what does it cost?

Lastly, an investor shared that: "I have actually stepped into our companies and been there for extended periods of time and done the job. So, the longest time I did was for two years. I was the CEO of one of our companies.". Therefore, even people outside a startup can provide and enact the empowerment competency.

In addition, we found that startups gained access to knowledge and competencies from people in Silicon Valley's ecosystem not necessarily through being one of their investors or advisors but simply just through being a mentor or a person they meet. We observed how this willingness to share and provide knowledge

to others—the “pay-it-forward” culture—characterized the Silicon Valley ecosystem and manifested itself in open-minded, helpful individuals who willingly made an effort on behalf of others without expecting any direct payoff. One CEO described his experiences as follows: “It is just, you know—can I do something to help you improve? And that is very epoch-making, ...and it has just been a snowball effect ever since.”. Hence, the pay-it-forward culture highlights the importance of the networking competency and enables startups to gain access to external competencies. At the same time, Silicon Valley’s ecosystem attracts well-educated and talented entrepreneurs, and investors use these entrepreneurs’ abilities to generate concrete results and attract referrals as key screening criteria. One investor explained: “The only way for us to tell whether you are a good entrepreneur or a bad entrepreneur is if someone says: ‘You know, she is a very good entrepreneur’.”. This quote implies that the Silicon Valley ecosystem expects entrepreneurs to be ambitious and self-disciplined, which highlights the importance the perseverance and envisioning competencies.

According to our findings, individuals outside the startups we examined sometimes provided the eight key competencies that the startups enacted, which illustrates that the startups had access to a portfolio of competencies that the CEO, startup team members, and individuals in the ecosystem possessed. The startups needed both management (e.g., business orchestration) and development (e.g., digital product development) competencies, but they could reside both in and outside their bounds. Consequently, a startup could, for example, source digital product development to one or more individuals in the ecosystem as long as the CEO or the startup team members could acquire, integrate, and enact competences from external parties. Thus, who exactly enacted competencies depends on the specific situation and the work task at hand as the above examples convey.

As an example, Figure 2 illustrates the portfolio of competencies in one of the startups across the CEO, startup team members, and individuals in the ecosystem.

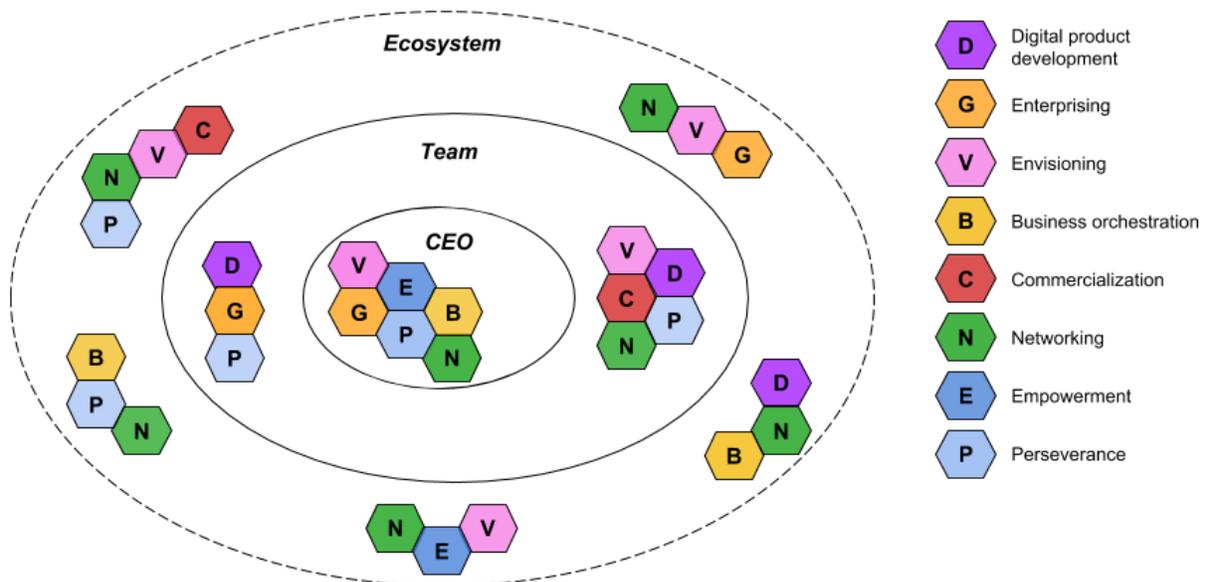


Figure 2. Example Competency Portfolio of Startup

5 Ambidexterity in Startups

In this section, we reflect on the competency findings that we present by applying insights and perspectives from the ambidexterity literature. In doing so, we theoretically assess the relationship between how startups enact competencies, how they balance exploitation and exploration, and the context that facilitates this balance.

5.1 The Ambidextrous Startup

Our findings show that CEOs—as head of startup teams—often quickly assess tasks that confront the team and then assigns them to team members, including themselves, in order for them to perform the tasks according to urgency and impact. For example, as one CEO explained:

We are developing the product and I have made a plan together with the boys saying what they are supposed to work on for the next four to five weeks, and then there is marketing, and that's it. But how much money would I be able to raise back home contra here in Silicon Valley? I believe that the chances are greater here, so I left [to attend the SCALEit program].

Hence, this quote expresses an example of the balancing act between the explorative activity of developing the product and the exploitative activity of raising money. The CEO elaborated: “In general, we have a rule saying that everyone helps where it is most important. ...Even if I end up having to clean the floor so the other guys can code, then that is what it takes.”. Consequently, in accordance with Gupta, Smith, and Shalley's (2006, p. 693) definition of ambidexterity as “the synchronous pursuit of both exploration and exploitation via loosely coupled and differentiated subunits or individuals, each of which specializes in either exploration or exploitation”, the startups pursuing digital innovation managed to act ambidextrously at an organizational level via orchestrating how they enacted competencies. This orchestration has a certain similarity to what Smith and Tushman (2005) define as the “leader-centric” model of integrating contradictory agendas, which implies that the CEO acts as an organizational integrator by aligning and orchestrating the efforts of startup team members and individuals outside the startup who provide any necessary missing competencies. However, the other startup members act in a similar capacity, which evidences contextual ambidexterity rather than leadership-based ambidexterity. To illustrate, one CEO described how he connected startup team members with individuals in the Silicon Valley ecosystem: “So, we touch base once in a while and I say: ‘What do you need? I made contact to this guy; I can facilitate the contact to you.’. ...So, I hook them up and make an email introduction, and then he [the startup team member] handles it from there.”.

Moreover, our findings show that CEOs not only contribute to striking an overall balance between exploration and exploitation but also self-administer the time they spend on exploitative and explorative tasks. One CEO explained:

I know exactly when our money will run out, and based on that I know that if I am not getting some [money] before that, then we will run out, and then we won't have a secure foundation. So, when it is getting urgent, I will dedicate myself a 100% to that.

Consequently, as the need for obtaining money becomes urgent, CEOs shift attention from running the startup each day (for which they enact the business orchestration and empowerment competencies) to focusing on the future need for funds (for which they enact the business orchestration, networking, envisioning, and enterprising competencies). CEOs' ability to judge for themselves how to divide the time between exploitation and exploration expressed in the quote above indicates that one can define startup CEOs as ambidextrous individuals (Gibson & Birkinshaw, 2004). As we mention in Section 4.9, the startup CEOs we examined were generalists and often displayed all or most of the key competencies, which enabled them to enact these competencies in different ways and perform both exploitative and explorative tasks.

In contrast to the tenets of the “leader-centric” model (Smith & Tushman, 2005), the CEO does not represent the only ambidextrous individual in a startup who orchestrates how startup members and external individuals enact competencies. Our research shows that all startup team members balanced their activities between exploitation and exploration. For example, one startup team member claimed: “I'm responsible within two areas. One is the production of the digital product. And then innovation as a whole, so implementing new technologies.”. Therefore, this startup team member was responsible for exploitative activities (e.g., ensuring the product's physical production and, thus, enacting the digital product development and enterprising competencies) and explorative activities (e.g., scouting for new technologies and possible ways to build the product and, thus, enacting the networking, digital product development, envisioning, and enterprising competencies). Another startup team member described being responsible for marketing (e.g., executing daily marketing tasks and exploring new marketing tools and opportunities). Accordingly, in startups, team members need to perform both explorative and exploitative tasks and to balance the two. As a result, we can characterize startup team members we examined also as ambidextrous individuals (Gibson & Birkinshaw, 2004). As the above examples illustrate, individuals use the same competencies for both

explorative and exploitative tasks. As such, our findings resemble Peppard and Ward's (2004) finding that how startup team members express a competency depends on the context.

Our findings also suggest that startup team members also assess when and how to access the knowledge and competencies of individuals outside the startup. Consequently, individual startup team members' judging how to balance their effort between exploitation and exploration also implies that they need to assess when and how to enact the competencies of individuals outside the startup. Achieving ambidexterity in this way in the startup resembles Smith and Tushman's (2005) "team-centric model". The team-centric model describes how team members coordinate and balance their contradictory tasks themselves by embracing conflict and possessing roles and responsibilities at different levels (Smith & Tushman, 2005), which relates to the context that facilitates their actions, which we discuss in Section 5.2.

5.2 The Facilitating Context

As we mention in Section 4 the startups prioritized chemistry and cohesion when hiring new startup team members, which created the foundation for a facilitating social context (Gibson & Birkinshaw, 2004). One startup team member highlighted how trust constitutes an important facilitating factor: "It is merely a question of informing the others rather than asking them for permission". Moreover, in acting the empowerment competency, which implies joint decision making, startup team members foster a trusting environment in which they coordinate and integrate their knowledge and balance their activities individually. One team member explained:

If I sense that what the other team members are working on is important to my connection and understanding of the project as a whole, then I simply just have to ask them for an update and gain the knowledge I need to know what is going on.

Therefore, the democratic leadership style associated with the empowerment competency facilitates the team-centric way of achieving ambidexterity (Andriopoulos & Lewis, 2009; Smith & Tushman, 2005). In addition, our findings demonstrate that the facilitating social context closely relates to Silicon Valley's pay-it-forward cultural characteristic since it implies a trusting and supportive mindset. We found this mindset among the startup team members we examined since, according to one CEO, they undertook "different roles in order to help and support each other". Thus, one can ascribe the supportive culture in startups to the CEOs and startup teams enacting the empowerment competency, which suggests that startup CEOs and team members all play important roles in achieving ambidexterity (Andriopoulos & Lewis, 2009; Gibson & Birkinshaw, 2004; Lubatkin et al., 2006).

As we mention in Section 4, team members obtain new knowledge and skills themselves, reach out to their network when performing their tasks, and do whatever it takes to achieve their goals. Accordingly, our research demonstrates how startup team members stretch themselves in order to fulfill their delegated responsibilities and make an actual impact. Silicon Valley's ecosystem, which features an expectation of ambition and self-discipline and differentiates entrepreneurs by their results and referrals, amplifies this performance management culture and, thus, emphasizes the enterprising competency. Therefore, the startup context entails both stretch and discipline and resembles the understanding of Gibson and Birkinshaw (2004) who claim that startups achieve contextual ambidexterity through a balance between the social context and performance management elements.

To summarize, the context of the startups dealing with digital innovation entails an open-minded, helpful, and trusting culture, which simultaneously involves high ambition and a persevering spirit. This culture encourages entrepreneurs to contribute to this trusting and supportive environment while also striving to excel and generate results. Based on this reflective analysis, our findings suggest that the context defining startups pursuing digital innovation is "dynamic and flexible enough to allow individuals to use their own judgment as to how they divide their time between alignment-oriented and adaptation-oriented activities, and both are valued and rewarded" (Gibson & Birkinshaw, 2004, p. 211). Additionally, this context enables startup members to determine when to reach out to their surrounding ecosystem to access and enact the required competencies.

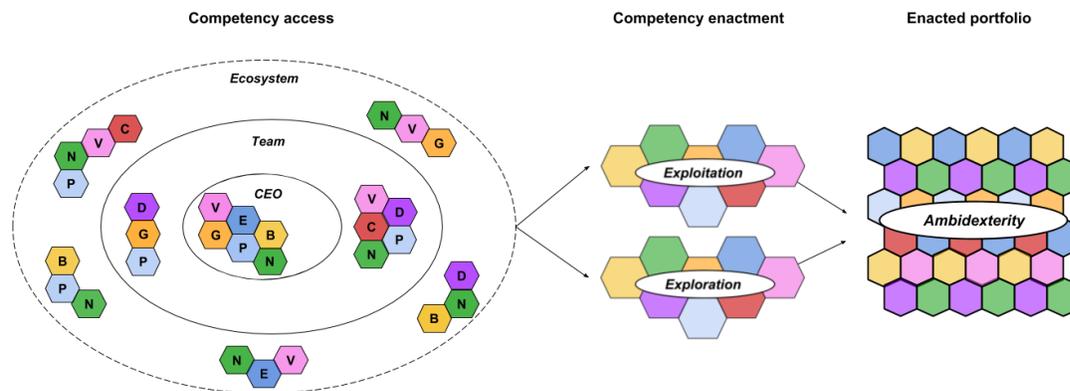


Figure 3. Achieving Ambidexterity in Startups via Enacting Key Competencies

Therefore, this reflective analysis reveals that, in general, startups dealing with digital innovation manage to behave ambidextrously via enacting eight key competencies that their CEO, startup team members, or individuals in the surrounding ecosystem provide. This enactment occurs via these individuals' using key competencies for exploratory and exploitative tasks, respectively. Figure 3 depicts this relationship.

6 Discussion and Future Directions

In this paper, we investigate how startups pursuing digital innovation can manage ambidexterity. In this section, we discuss our findings in relation to the existing ambidexterity literature and, thus, accentuate our contributions and their limitations while also proposing areas of ambidexterity research that require further investigation.

With this paper, we extend Volery et al.'s (2013) observation of entrepreneurs' everyday exploration-exploitation behavior. Whereas they identify six behavioral ambidexterity patterns, we identify the competencies that allow these entrepreneurs—in the words of Volery et al. (2013)—to juggle different roles in order to navigate the tension between exploration and exploitation. Researchers have previously investigated some of these competencies (e.g., “enterprising” in the form of leadership skills) (Schoemaker, Krupp, & Howland, 2013), although not in the startup context. Moreover, in contrast to Cragg et al. (2011) who identify IS competencies at the organizational level, we help to explain the portfolio of competencies at the individual level that startups need to access and enact to achieve organizational ambidexterity. We draw on Feeny and Willcocks' (1998a, 1998b) framework in defining and analyzing competencies. Whereas Feeny and Willcocks examine the core IS capabilities (which constitute the multiple competencies and skill sets that enable organizations to successfully manage the supply and demand for IS/IT services) for exploiting information technology, we take a broader ambidexterity perspective. We recognize the dual imperative of managing exploitation and exploration in both startups and established organizations, and we investigate how startups perform both explorative and exploitative tasks by enacting key competencies in their portfolio. This competency enactment allows them to achieve ambidexterity. Thus, our study extends Feeny and Willcocks' (1998a, 1998b) research and other exponents of the resource-based view (RBV) of the firm by investigating how startups can combine competencies in a portfolio and leverage them in pursuing competing concerns. In terms of competency portfolio, our conceptualization resembles that of Stratman and Roth (2002) who, in an ERP context approach, conceptualize it as a portfolio of skills and expertise. While Kuckertz et al. (2010) establish the link between ambidextrous strategic management and firm performance, our study shows how startups enact competencies as portfolios to effect ambidextrous behavior. Beckman (2006) examines the antecedents of exploration, exploitation, and organizational ambidexterity and concludes that “exploring and exploiting may require management teams to draw on members' common and unique affiliations” (p. 753). Our investigation not only corroborates this finding but also demonstrates the importance of access to key competencies at the management (the CEO), team, and ecosystem levels. Our research reveals how startups can enact their competency portfolio of eight key competencies to execute both explorative and exploitative tasks and, thus, make this competency enactment a means to achieve ambidexterity. Through assessing the tasks at hand, they can ascertain the appropriate enactment of competencies that either the CEO, startup team members, or individuals in the ecosystem provide. Consequently, startups manage to balance their exploitative and explorative efforts. In doing so, we answer the call for empirical studies of entrepreneurs' ambidextrous behavior (Mueller et al.,

2012), team startups (Brem, 2017), and research on how to resolve the challenges of creating “a combinatory mindset within the firm” (Parida et al., 2016, p. 1158). The open-minded, supportive, and result-oriented context that constitutes the environment in which startups access their competency portfolio helps them to attain ambidexterity in this way. Accordingly, despite the fact that startups have scarce resources and limited in-house competencies, they can still behave ambidextrously since they have access to a competency portfolio that crosses organizational boundaries, which means that they can combine competencies via internal and external stakeholders’ contributions. This finding that shows the surrounding ecosystem to be an equally important contributing factor in achieving organizational ambidexterity represents a novel contribution to state-of-the-art knowledge. With the exception of Raisch et al. (2009), the existing ambidexterity literature has focused on how to achieve ambidexterity through different ways of arranging internal resources and work processes—whether through structural separation, contextual factors, or leadership action (Adler et al., 1999; Gibson & Birkinshaw, 2004; Lubatkin et al., 2006; Smith & Tushman, 2005). Consequently, we broaden our understanding of ambidexterity with this research in finding that startups involve their surrounding ecosystem when balancing exploitation and exploration efforts. Based on this finding, we suggest that researchers explore further how corporations, or business units in corporations, can attain ambidexterity by leveraging the environment in which they exist.

However, our findings also support Gibson and Birkinshaw’s (2004) findings and, thus, accentuate the importance of the elements of stretch, discipline, trust, and support for startups when they establish a context facilitating ambidexterity. Therefore, our study emphasizes that these factors are just as important in startups as in the business units of large corporations where researchers originally discovered them, though our research also reveals that the facilitating context spans the surrounding ecosystem of Silicon Valley. Therefore, the way of achieving ambidexterity that we outline relies on the facilitating context to span both the startup and the surrounding environment. Moreover, our findings highlight the importance of the CEO’s leadership style when it comes to creating a favorable context in which ambidexterity can thrive. The CEO may nurture such a context by enacting the empowerment competency. This finding resembles Gibson and Birkinshaw’s (2004, p. 223) emphasizing “the important role played by senior executives in making an organization context effective and developing ambidexterity”.

In addition, our findings reveal that startups can achieve ambidexterity through enacting competencies in two ways: either through the “leader-centric” model (which features an ambidextrous CEO who orchestrates the startup team members’ activities and involves individuals in the ecosystem) or through the “team-centric” model (which features all startup team members’ acting ambidextrously and, thus, coordinating and balancing their own tasks). Accordingly, both approaches imply ambidextrous individuals. However, the question about whether individuals can actually excel at both exploitation and exploration due to their different personalities and preferences remains (Gupta et al., 2006). In this study, we could not assess performance quality when the CEO and startup team members both performed exploitative and explorative tasks. We can conclude only that both startup team members and CEOs executed both kinds of tasks and assessed for themselves how to balance their efforts and, thereby, characterize them as ambidextrous individuals. As such, we encourage future research to assess the quality of performance of ambidextrous individuals and measure if they perform exploitative and explorative tasks equally well.

Finally, we propose that ambidexterity is a state of acting that manifests itself via a startup’s enacting the competency portfolio available to it. This finding opposes the findings of Tarafdar and Gordon (2007) who, in their study of competencies that support innovation processes, define ambidexterity as an obtainable competency along with others such as “project management” and “process modeling” (Tarafdar & Gordon, 2007). Their perspective implies that an organization possesses ambidexterity internally (i.e., that business units or organizations are ambidextrous if they possess that particular competency). However, based on our findings, we argue that ambidexterity results from startups’ enacting a portfolio of competencies and does not represent a competency in itself.

6.1 Limitations

Our research helps to explain how, by enacting competencies, startups pursuing digital innovation can attain organizational ambidexterity. Accordingly, we focus on ambidexterity in this study, while the competency literature functions as a particular perspective that provides an enriched understanding of ambidexterity. Due to our study’s scope, we do not examine the broader perspectives of the competency literature. As we mention above, we also relied on qualitative data from startups that participated in the SCALEit program. However, using such data constitutes an empirical limitation since our empirical data foundation comprises only contributions from startups that met certain variables that the SCALEit program requires.

Consequently, we recognize that our sample represents just one sample of startups conducting digital innovation. Additionally, we observed the SCALEit program throughout the one-week program and conducted the interviews over the course of that week. From the interviews and observations, we came to better understand the day-to-day operations in the startups; however, our empirical data does not contain actual observations of the startups' day-to-day operations since the participants did not work in their natural working environment for the duration of the SCALEit program. Finally, we acknowledge that our sample featured a disproportionate number of CEOs, which limits our empirical data in the sense that it might have biased our findings. However, we took care to ask the participating CEOs to explain in detail their team members' activities, roles, and contributions. With that said, we encourage researchers to conduct future studies of startup teams in their natural working environment.

6.2 Implications for Practitioners

Based on the insights we gained from our research, we propose several suggestions for practitioners. First, to achieve ambidexterity, startups pursuing digital innovation should make sure that their competency portfolio provides access to all eight key competencies we found. On account of this access, they will be able to enact all of the competencies to simultaneously perform exploitative and explorative activities as needed. Second, startups should keep in mind that the constitution of the competency portfolio does not need to rely solely on individuals in the startup since advisors, investors, mentors, and others in the surrounding ecosystem can also contribute with competencies. Accordingly, we suggest that business unit leaders and enterprise CEOs consider the surrounding ecosystem as an active part of their competency portfolio. Third, to proactively manage challenges that engender a startup's progress, we suggest mapping the competencies available in house and through external providers to gain insight into the missing competencies. Startups can use this map of missing competencies for directions with regard to which competencies to look for when expanding the advisory network or hiring new employees. Investors can also use a map of a startup's current competencies to assess if the current startup team is too "inbred" (as one investor termed it), which means that startups that have mastered only some of the eight key competencies will need to spend time and money filling up the competency portfolio by expanding their team and network. Finally, our research suggests that startup CEOs who wish to attain ambidexterity by leveraging their startup team of ambidextrous individuals will have to focus on creating an enabling context.

7 Conclusion

With this research, we help to explain how startups pursuing digital innovation manage to attain organizational ambidexterity in hypercompetitive global markets. Through a multiple case study of startups affiliated with the entrepreneurial accelerator program SCALEit, we found that these startups achieve organizational ambidexterity by enacting eight key competencies: digital product development, enterprising, envisioning, business orchestration, commercialization, networking, empowerment, and perseverance. In their totality, these key competencies constitute a competency portfolio available to the startups. By enacting the appropriate competencies, the startups could simultaneously perform both explorative and exploitative tasks and, thus, achieve ambidexterity. Moreover, we found how the startups' CEO, team members, and individuals in their surrounding ecosystem provided the eight key competencies, which suggests that the startups had access to a competency portfolio that crossed organizational boundaries. Further, the startups could leverage this competency portfolio due to the open-minded, supportive, and result-oriented context that constituted the environment in which the startups existed. In this regard, our research shows that a startup's CEO's leadership style and behavior constitutes an important factor in facilitating an organizational context that supports startup team members in judging for themselves how to divide their time between exploitative and explorative activities and in evaluating when to involve external competencies. Even though startups pursuing digital innovation typically feature scarce resources, our study concludes that they manage to attain organizational ambidexterity by combining and enacting internal and external competencies in their portfolio to perform both exploitative and explorative tasks.

References

- Adler, P. S., Goldoftas, B., & Levine, D. I. (1999). Flexibility versus efficiency? A case study of model changeovers in the Toyota production system. *Organization Science*, *10*(1), 43-68.
- Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-exploration tensions and organizational ambidexterity: Managing paradoxes of innovation. *Organization Science*, *20*(4), 696-717.
- Beckman, C. (2006). The influence of founding team company affiliations on firm behavior. *Academy of Management Journal*, *49*(4), 741-758.
- Blank, S., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. Pescadero, CA: K&S Ranch Press.
- Boyatzis, R. (1982). *The competent manager: A model for effective performance*. New York, NY: John Wiley & Sons.
- Brem, A. (2017). Creativity and routine: conceptual considerations on managing organisational ambidexterity in entrepreneurial ventures. *International Journal of Entrepreneurship and Innovation Management*, *21*(3), 261-273.
- CBInsights. (2015). *Silicon Valley tech venture capital almanac*. Retrieved from <https://www.cbinsights.com/venture-capital-silicon-valley>; 06-06-2016.
- Cragg, P., Caldeira, M., & Ward, J. (2011). Organizational information systems competences in small and medium-sized enterprises. *Information & Management*, *48*(8), 353-363.
- D'Aveni, R. A. (1998). Waking up to the new era of hypercompetition. *The Washington Quarterly*, *21*(1), 183-195.
- Du, W., Pan, S. L., & Zuo, M. (2013). How to balance sustainability and profitability in technology organizations: An ambidextrous perspective. *IEEE Transactions on Engineering Management*, *60*(2), 366-385.
- Feeny, D. F., & Willcocks, L. P. (1998a). Core IS capabilities for exploiting information technology. *MIT Sloan Management Review*, *39*(3), 9-21.
- Feeny, D. F., & Willcocks, L.P. (1998b). Re-designing the IS function around core capabilities. *Long Range Planning*, *31*(3), 354-367.
- Fichman, R. G., Dos Santos, B. L., & Zheng, Z. (2014). Digital Innovation as a fundamental and powerful concept in the information systems curriculum. *MIS Quarterly*, *38*(2), 329-343.
- Freeman, J., & Engel, J. S. (2007). Models of innovation: Startups and mature corporations. *California Management Review*, *50*(1), 94-119.
- Ghoshal, S., & Bartlett, C. (1994). Linking organizational context and managerial action: The dimensions of quality in management. *Strategic Management Journal*, *15*(S2), 91-112.
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, *47*(2), 209-226.
- Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, *49*(4), 693-706.
- He, Z., & Wong, P. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, *15*(4), 481-494.
- Herterich, M., & Mikusz, M. (2016). Looking for a few good concepts and theories for digitized artifacts and digital innovation in a material world. In *Proceedings of the 37th International Conference on Information Systems*.
- Huang, J., & Kim, H. J. (2013). Conceptualizing structural ambidexterity into the innovation of human resource management architecture: The case of LG Electronics. *The International Journal of Human Resource Management*, *24*(5), 922-943.

- Innosight. (2012). *Creative destruction whips through corporate America*. Retrieved from http://www.innosight.com/innovation-resources/strategy-innovation/upload/creative-destruction-whips-through-corporate-america_final2015.pdf; 06-06-2016
- Innovation Centre Denmark. (2015). *Silicon Valley*. Retrieved from <http://icdk.um.dk/en/innovationcentres/siliconvalley>
- Krantz, J., & Maltz, M. (1997). A framework for consulting to organizational role. *Consulting Psychology Journal: Practice and Research*, 49(2), 137-151.
- Kuckertz, A., Kohtamäki, M., & Körber, C. (2010). The fast eat the slow—the impact of strategy and innovation timing on the success of technology-oriented ventures. *International Journal of Technology Management*, 52(1/2), 175-188.
- Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small-to medium-sized firms: The pivotal role of top management team behavioral integration. *Journal of Management*, 32(5), 646-672.
- Miles, M. B., & Huberman, M. A. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.) Thousand Oaks, CA: Sage.
- Mueller, S., Volery, T., & von Siemens, B. (2012). What do entrepreneurs actually do? An observational study of entrepreneurs' everyday behavior in the start-up and growth stages. *Entrepreneurship Theory and Practice*, 36(5), 995-1017.
- Nielsen, M. T., (2017). Let's not forget about the SME's. *Innovation Centre Denmark*. Retrieved from www.icdk.us/blog/lets-not-forget-about-the-smes
- O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185-206.
- Parida, V., Lahti, T., & Wincent, J. (2016). Exploration and exploitation and firm performance variability: A study of ambidexterity in entrepreneurial firms. *International Entrepreneurship and Management Journal*, 12(4), 1147-1164.
- Pavlou, P. A., & El Sawy, O. A. (2006). From IT leveraging competence to competitive advantage in turbulent environments: The case of new product development. *Information Systems Research*, 17(3), 198-227.
- Peppard, J., & Ward, J. (2004). Beyond strategic information systems: Towards an IS capability. *The Journal of Strategic Information Systems*, 13(2), 167-194.
- Prahalad, C., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79-91.
- Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, 34(3), 375-409.
- Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. L. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, 20(4), 685-695.
- Ravichandran, T., & Lertwongsatien, C. (2005). Effect of information systems resources and capabilities on firm performance: A resource-based perspective. *Journal of Management Information Systems*, 21(4), 237-276.
- SCALEit. (2015). *You are one click away from Silicon Valley*. Retrieved from <http://www.scaleit.us>
- Schoemaker, P., Krupp, S., & Howland, S. (2013). Strategic leadership: The essential skills. *Harvard Business Review*, 91(1/2), 131-134.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.
- Smith, W., K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16(5), 522-536.
- Spradley, J. P. (1980). *Participant observation*. Belmont, CA: Cengage.

- Stratman, J., & Roth, A. (2002). Enterprise resource planning (ERP) competence constructs: Two-stage multi-item scale development and validation. *Decision Sciences*, 33(4), 601-628.
- Tarafdar, M., & Gordon, S. R. (2007). Understanding the influence of information systems competencies on process innovation: A resource-based view. *The Journal of Strategic Information Systems*, 16(4), 353-392.
- Volery, T., Mueller, S., & von Siemens, B. (2015). Entrepreneur ambidexterity: A study of entrepreneur behaviours and competencies in growth-oriented small and medium-sized enterprises. *International Small Business Journal*, 33(2), 109-129.
- White, R. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66(5), 297-333.
- Willcocks, L., & Feeny, D. (2006). IT outsourcing and core IS capabilities: Challenges and lessons at DuPont. *Information Systems Management*, 23(1), 49-56.
- Yin, R. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage.
- Yoffie, D. B. (1996). Competition in the age of digital convergence. *California Management Review*, 26(4), 1-53.
- Yoo, Y., Boland, R., Lyytinen, K., & Majchrzak, A. (2012). Organizing for innovation in the digitized world. *Organization Science*, 23(5), 1398-1408.
- Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010a). Research commentary—the new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research*, 21(4), 724-735.
- Yoo, Y., Lyytinen, K., Boland, R., & Berente, N. (2010b). *The next wave of digital innovation: Opportunities and challenges: A report on the research workshop "Digital Challenges in Innovation Research"*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1622170

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