**An exploratory study of entrepreneurial social networks in the digital age**

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**Abstract**

**Purpose** – Drawing on social network and social capital literature, this study seeks to explore how digital entrepreneurs utilize social networks to build their entrepreneurial capability, creating and developing business ventures in a digitally networked society.

**Design/methodology/approach** – The study takes a qualitative approach, interviewing 35 digital entrepreneurs with businesses operating across multiple industry sectors in Western Australia.

**Findings** – The findings suggest that structural social capital provides a key resource with groups of relational contacts who facilitate in building entrepreneur capability, the venture, and customer markets. Relational social capital provides a foundation of trust between entrepreneurs and social network members that is strategically important for digital entrepreneurship. Cognitive social capital provides mechanisms to form relationships based on shared values across social networks.

**Research limitations/implications** – The study produces early evidence that in a multiplexed networking world, social capital accrual and use online, is different from that of offline. More empirical studies are needed to understand the complexity of the changing nature of online and offline social networks, the consequential social capital, and their interdependence in digital entrepreneurship.

**Practical implications** – This is an exploratory qualitative study using a limited sample of 35 Australian digital entrepreneurs to explore the impact of social network interaction on digital entrepreneurs and their ventures, with the purpose of stimulating a social network approach when studying digital entrepreneurship. This study confirms the critical importance of entrepreneurial social networks in the digital age and provides empirical evidence that online networks foster business development, while offline networks feed self-development.

**Originality/value –** The study contributes to current research on digital entrepreneurship as a dedicated new research stream of entrepreneurship. Specifically, the study contributes to a greater understanding of how digital entrepreneurs leverage social networks in today’s digitally connected society.

**Keywords:** digital entrepreneurship, networking, social networks, social capital

1. **Introduction**

Studies of the impact of digital technologies on the entrepreneurial process and its outcomes have started to form a new stream of research in entrepreneurship literature called digital entrepreneurship research (Nambisan, 2017). For this study, we adopt Zaheer et al’s definition (2019, p3) and view digital entrepreneurship (DE) as ‘the process of creating a digital startup as a new business or within an established firm’ and digital entrepreneurs as those who create and run digital-based businesses.

DE has been viewed as a critical pillar for economic growth, job creation, and innovation by many countries (ECEI, 2015). Early forecasting suggested that DE may add $1.36 trillion to the future world's top ten economies and could generate 10 million additional jobs by 2020 (Nanterne, 2014). Given the momentum of DE, as a rapidly growing business phenomenon, has gained, studies on how digital technologies act on the entrepreneurial process are growing, according to recent literature reviews on digital entrepreneurship (Kraus et al. 2019; Zaheer et al., 2019). Among them, some studies discuss how digital technologies enable new and innovative venture configurations and processes (Suh, et al. 2008; Asghari and Gedeon, 2010; Esmaeeli, 2011) while others focus on matters such as how DE affects entrepreneurial business models (Bharadwaj et al. 2013). Nambisan (2017) argues that digital technologies have two significant implications for entrepreneurship research: less stable boundaries in entrepreneurial processes and outcomes, and a less predefined and predictable locus of entrepreneurial agency among founders and other actors.

From a consumers’ perspective, research demonstrates how digital technologies enable new forms of connectivity and relationships with customers that are re-shaping entrepreneurial activity. For example, Internet connectivity can increase the reach and speed of customer feedback and pre- or post-purchase interaction. Social media is being used to shape venture strategies or products through crowd-sourcing and other forms of digital social feedback (Fischer and Reuber, 2011). Customers can configure products at the design stage, while 3-D scanning and modeling options provide information about user’s contexts and demographics (Nambisan, 2017). MacGregor (2004) indicated that more highly educated entrepreneurs with a venture marketing strategy were more liable to benefit from formal social networking opportunities. As digital communication has evolved, entrepreneurs have had to develop a new range of competencies to access digital social networks (Ngoasong, 2018). Allen et al (2016) indicate that entrepreneurs who focus on communication intensity prosper the most from their interactions, while Barber et al (2019) note that there is a positive connection between accessing digital platforms and the evolution of business models.

While prior studies on DE capture how digital technologies impact the digital entrepreneurial process, business models and activities, and change the role of customers in product design and production, there appears to be a need for an in-depth understanding of the social and relational aspects of DE. For example, Srinivasan and Venkatraman (2018) indicate that existing studies on entrepreneurship are limited in examining social networks, and more so in relation to networks across digital platforms. The objective of this study is to explore how digital entrepreneurs utilize social networks to build their entrepreneurial capability, creating and developing business ventures in a digitally networked society. It focuses on the social interaction process in entrepreneurial networks, both online and offline. While some DE research focuses on technology as the central feature of DE (e.g., Nambisan 2017; Rusonis 2015), we argue that it is the new opportunities for networking through social media and digital platforms as well as new forms of the workplace such as co-working spaces that need to be further explored.

Smith and Smith (2019) define networking as ‘the process of creating, building, and managing a network of beneficial relationships with others, and Jarillo (1989; p.133) defines it as ‘a system by which entrepreneurs can tap resources that are external to them by the use of all personal relationships. While technology enables partnerships and collaboration in the process of crowdsourcing, design feedback, and product customization, networking among multiple stakeholders has as much as, if not greater, an impact on the venture development process (Wiberg and Nyberg 2012). Therefore, we consider that it is important to study the social and relational aspects of digital entrepreneurship.

Although research on entrepreneurial networks and social capital has been a well-established topic, researchers have argued that DE is at the intersection of digital technologies with traditional entrepreneurship and innovation processes and outcomes. Therefore, DE requires investigation of the intersection as a novel phenomenon (Berger et al. (2019). In the digital age, social relations are augmented by virtual relations. Virtual social relations have the capacity to leap borders in seconds, extending the reach and field of relational interaction in a previously inconceivable way, and drastically changing the role of networking for digital business.

To maintain the focus of our study, we restrict our efforts to understanding the social and relational aspects of DE. In developing the theoretical foundation for this study, we were thus drawn to social network and social capital literature, given the intrinsic relationships that exist between the two (Kim and Aldrich, 2005). Social network theory provides a basis for exploring the properties and relationships of digital entrepreneurs’ networks, online and offline, while social capital theory provides a theoretical lens to study the resources generated through networking for the personal and business development of digital entrepreneurs. Underpinned by the key elements of the two theories, we developed a theoretical framework as the groundwork for this study.

To gain an in-depth understanding of the role that social network interactions play in the process of DE development, we adopted a Ptolemaic view that considers digital entrepreneurs as the central point of networking and investigated their network relationships from their perspective, exploring how those interactions impacted upon the entrepreneurs and their ventures. To that end, we interviewed a small group of 35 digital entrepreneurs in Australia for an exploratory qualitative study to investigate the impact of social network interaction on digital entrepreneurs and their ventures, with the goal of encouraging a social network approach when studying digital entrepreneurship.

1. **Theoretical basis and framework**

2.1 Social network theory and research

 From a social science perspective, a social network is a structure in which a group of actors are connected by a set of social relationships, ties, or a specified type of ties (Borgatti et al. 2009). The theory has been used in many disciplines to explain connections and relationships in a social structure (Akar and Dalgic, 2018; Kadushin 2012; Wasserman and Faust 1994).  In social networks, some ties or links may be stronger than others, and some may be unidirectional and others bidirectional (Maertens and Barrett 2013). The structural configurations of the networks and the quality of the constituent ties, such as their frequency, intensity, and multiplicity, are some of the focus areas for research (Adler and Kwon, 2002; Granados and Rivera 2018). For our study, we explore in greater detail how digital entrepreneurs utilize social networks to build their entrepreneurial capability, create and develop business ventures in today’s digitally networked society, rather than mapping and analyzing network structure.

Since entrepreneurs and entrepreneurship are socially situated (Gedajlovic et al. 2013) and networked (Hansen, 1995; Yetis-Larsson et al. 2015), we consider that a social network theory approach provides useful insights into the role of networking in digital entrepreneur capability building, venture creation, and development. The empirical evidence presented by Spiegel et al. (2016) demonstrated how digital venture founders leverage their social networks in developing their start-up models. Indeed, social networks serve as conduits to create value (Granados and Rivera 2018), and similarly, an entrepreneur's social networks provide resources that might be useful for value creation, such as the identification and exploitation of entrepreneurial opportunities.

In this study, we focus on the social networks that are created and sustained online by digital technologies such as social media (Smith et al. (2017), and also those in an offline setting, such as networks formed when interacting with others in co-working spaces as these networks may offer entrepreneurs the platforms and venues for social networking (Bouncken and Reuschl, 2018; Davidsson and Honig 2003). Rosen et al. (2011) indicated that the relationship between online and offline social networks was complex and segmented. Online and offline networks are not dichotomous spaces for networking in a multiplexed digital world. While recent studies have indicated that these two spheres have different patterns of interaction and management, there is no clear perspective of how such variations impact digital entrepreneurs. Our study will illuminate such issues.

Williams and Durrance (2008) suggest that social networks should be conceptualized as operating at three levels – individual, business, and societal. Individual social networks represent one's personal networks, whereas business networks represent one's circle of business partners, including co-owners, venture capitalists, and even mentors. In addition, every actor is embedded within a broader societal network. So, their actions affect, and are influenced by, the relationships with others in their community, and indeed in wider society. We adopted this theoretical approach to investigate how social networks at each of the levels influence digital entrepreneurs, defining the groups as follows: Personal- families, friends, mentors; Business **-** funders, incubators, coworking spaces; Societal **-** customers.In this regard, our network analysis goes beyond the individual level, while taking entrepreneurs as the central point in all three levels of networks. This approach resonates well with a Ptolemaic view in entrepreneurial network studies, which describes how the network looks to the individual and from his/her perspective as the insider (Jack, 2010 p130).

2.2 Social capital theory and research

There are significant controversies and debates in the definition and research of social capital (Anderson and Jack, 2002). Lin (1999 p.28) argued that social capital theory and research must be based on the fundamental understanding that social capital is captured from embedded resources in social networks. Nahapiet and Ghoshal (1998 p. 243) define social capital as ‘the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit’. In this regard, social capital is seen as resources and networks as sources. However, confusion remains in the literature between social networks and social capital. Network activity is considered by some as a manifestation of social capital (Casson and Giusta, 2007). However, some research investigates social capital purely from a network structure perspective and we agree that this makes it difficult to differentiate between sources and resources (Gedajlovic et al. 2013).

Research suggests that relationships form an important source of social capital providing benefits of access to information, knowledge, and resources (Suseno and Pinnington, 2018a). Adler and Kwon (2002) highlighted that social capital is important in facilitating inter-firm learning, product innovation, and entrepreneurship. Likewise, social capital is viewed as critical for knowledge access and organizational performance (Maurer et al., 2011; Stam et al., 2014). The studies of Casson and Giusta (2007) and Anderson et al. (2007) highlighted that social capital plays an important role in three aspects of entrepreneurship: opportunity seeking, resource acquisition, and market organization

Although the social capital theory has been widely used to capture the value of social relationships, it has received much criticism due to its operational ambiguity and confusion (Barbosa Neves et al. 2018; Soulard et al. 2018). Social capital is not unidimensional, with researchers tending to focus on different facets of social capital. It, therefore, presents a challenge when attempting to define and operationalize the construct itself,  as well as identifying and categorising the different sources and effects of social capital. Bourdieu (1972) and Coleman (1988) first explored the term and the components but provide different analyses and models with subsequent literature indicating six or seven different types of social capital. In our study, we adopted the more recent and established Nahapiet and Ghoshal (1998) categorization of social capital, with three distinct dimensions: structural, relational, and cognitive. The structural dimension of social capital refers to ‘the overall pattern of connections between actors, that is, who you reach and how you reach them’ (Nahapiet and Ghoshal, 1998 p. 244). Research suggests that actors who are better connected have been found to achieve more instrumental outcomes, as they are able to access more influential network contacts to gain unique resources (Suseno and Pinnington, 2018b). The study by Muniady et al. (2015) found that the three dimensions of social capital often work together to provide entrepreneurs with resources that are much needed but are not available in the first place. However, research also found that entrepreneurs from socially deprived areas often accrue less social capital from a network that centres around family and close friends only, than those well-educated entrepreneurs who can create more diverse networks, which provide greater beneﬁts (Yli Renko et al., 2001). In our study, we explored not just who the DEs related to, but where instrumental interactions impacted them and their ventures.

The second dimension of social capital, the relational dimension, refers to ‘assets created and leveraged through relationships. These assets generated from social relations (Aarstad et al. 2010) and Khoury et al. (2013) may include trust, trustworthiness, and social norms (Nahapiet and Ghoshal, 1998 p248). The research found that relational trust is important for entrepreneurs who seek to convert social ties to economic ones (Dahkli and De Clercq, 2004). For example, entrepreneurs who develop and maintain frequent social interaction with investors will develop strong and trustworthy relationships and are more likely to receive financial benefits from the relationships (Maula et al., 2003). In our interviews with digital entrepreneurs, we investigated how strong relations between DEs and individuals in their social networks built trust and subsequent benefits for the DE and their venture.

The third dimension of social capital, the cognitive dimension, focuses on the shared language, codes, narratives, interpretations, meanings, and systems of meaning among actors (Nahapiet and Ghoshal, 1998). Jonsson (2015) indicates that in terms of the main components of social capital, the cognitive dimension is the least researched. According to Jonsson's 2015 study, cognitive capital was the most important instrument in the relationships formed by new ventures, was more likely to generate sustained relationships, and frequently led to structural capital development. In contrast, in terms of gaining venture funding, Liao and Welsch (2005) found that cognitive capital was most utilised when ventures had already generated a viable business base. Finally, a recent study of social perceptions of entrepreneurs by Ziemiański (2018) indicates that the public views cognitive capital higher than the other dimensions of their social capital. However, in terms of this study, the findings of Lee and Jones (2008) are the most interesting as they indicate that a variation exists between entrepreneur's ability to generate cognitive social capital through face-to-face and online relational networks.

This three-dimension categorization allows us to better understand the effects of different dimensions of social capital on digital entrepreneur’s capability building and venture creation and development. However, essentially, accruing social capital online has already been suggested to be different from accruing it offline (Smith et al., 2017), and yet this critical variation has only recently begun to be discussed in more detail in the research examining social capital and entrepreneurship (Smith and Smith, 2019). Our empirical study will provide insight into the relationships between online and offline social capital and the different dimensions of social capital.

2.3 Relationships between social networks and social capital

Our approach of incorporating both the concepts of social networks and social capital into this study addresses a call for the cross-fertilization between social network research and social capital research (Kwon and Adler, 2014; Smith et al. 2017). This approach also resonates well with the view of Kim and Aldrich (2005 p94) who posit that ‘concepts from social network theory give us the tools to understand the association between social capital and entrepreneurship. Drawing on the research, we argue that social networks and social capital are two distinct concepts although they are often closely associated in related research fields (Sajuria et al., 2015; Yetis-Larsson et al., 2015). Social network theory allows us to investigate network properties, while social capital theory helps with the study of different dimensions of social capital. Empowered by the two concepts, we seek to explore how digital entrepreneurs utilize social networks, both online and offline, to build their entrepreneurial capability, create and develop business ventures.

Allen (1984), research indicated that people who we are in close proximity to work are those most likely to be contacts and influencers. This emphasizes the popularity and instrumentality of the current co-working spaces. Allen also introduced the concept of ‘gatekeepers’ to the flow of technical information that ventures require. From this perspective, the entrepreneur is a singular gatekeeper, forming network relations with individuals who have diverse and often competing interests so that links can be made and either business useful information can be obtained or relations formed that can facilitate even further beneficial relationships. The empirical studies of Batjargal (2007, 2010) demonstrated how the social networking skills of digital entrepreneurs help enrich social networks and accrue social capital to improve firms' performance. Likewise, Srinivasan and Venkatraman (2018) indicate that although social networks provide entrepreneurs with linkages to resources and module networks in digital platforms, such networks only create value if the networks are useful, of high quality, and easy to access (Granados and Rivera 2018). Kim and Aldrich (2005) found that the potential of social networks is often constrained by various social-cultural factors. Entrepreneurs who have high social capital are more likely to have trusting relations with others who provide them with information, knowledge, resources, and socialization (Ellison et al. 2014), which can help their entrepreneurial endeavours (Gedajlovic et al. 2013). There is evidence that it may be the quality rather than the size of entrepreneurial networks that determine the instrument impact upon the DE or their venture. Gloor et al (2018), found that individuals with very active and large Linkedin community interactions did not appear to benefit more than those who had more restricted and less embedded networks. In contrast, their more recent study (Gloor et al, 2020), indicates that venture board members may be more instrumental in network relationships with those associated with capital resources and active on social media attracting capital to the venture while not associated with capital appeared more instrumental in assisting the venture in leveraging assets into subsequent sales.While current research has established these relationships within entrepreneurship, our study investigates how these relations interact within the digital domain.

In conclusion, there is a body of academic work that shows the instrumentality of social networks in building entrepreneurial ventures and explores how diverse social capital derived or generated from such interaction impacts entrepreneurship. However, there is limited evidence about how these relations have changed as digital entrepreneurship has emerged and how digital interactions have changed the entrepreneurial process. Our study was aimed at filling this void and contributing to a better understanding of how digital entrepreneur social interactions relate to social capital and entrepreneur and venture development.

2.4 Theoretical framework for this study

In all well-designed research studies, a theoretical framework lays the groundwork for developing a simple and specific question for empirical inquiry. To explore our research question of how networking in social networks, both online and offline, influences DE development, we constructed a theoretical framework based upon social network and social capital theories. Our framework presented in Figure 1 constitutes the three levels of social networks (Williams and Durrance 2008) and the three dimensions of social capital (Nahapiet and Ghoshal, 1998). We argue that differentiating social capital by dimension and social networks by level helps uncover in greater detail how social networks are utilized and for what purposes. For the purpose of this study, drawing on the Ptolemaic view in entrepreneurial network studies, we define three levels of social networks as:

* The participant’s (i.e. digital entrepreneur’s) personal network of family, friends, and mentoring and educational learning relationships;
* The participant’s business network of co-owners, co-workers, colleagues, funders, supporters, mentors, suppliers, and business service providers; and
* The participant’s societal network of customers and a wider network of societal relations.

The three dimensions of social capital that may be generated from these networks are:

* The structural capital refers to whom digital entrepreneurs seek to reach or connect with;
* The relational capital refers to trust, reciprocity, and interactivity; and
* The cognitive capital refers to shared visions, expectations, and goals.

Research suggests that social networks are tools for social capital (Kim and Aldrich, 2005), and social capital may be realized through networking in social networks (Fischer and Reuber 2011; Smith and Smith (2019). Guided by the social network and social capital literature, we investigate how digital entrepreneurs engage with social networks, online and offline, to accrue social capital (i.e. resources), and how they utilize the social capital with regards to capability building, venture creation, and development in the entrepreneurial process.

**[Please insert Figure 1 about here]**

1. **Research design and data collection**

Our research question is how digital entrepreneurs utilize social networks, both online and offline, to build their entrepreneurial capability, create and develop business ventures in a digitally networked society. To answer this question, we took a qualitative approach, arguing that a qualitative methodology allowed us to undertake an in-depth study of digital entrepreneurs' experiences, perspectives, and life contexts (Yin, 2011). Although we build our research on the existing theoretical framework to lay a solid theoretical foundation, we focus not simply on what is happening but on how and why it is happening. There has been a preference for quantitative approaches to network analysis which focus mostly on the structural characteristics of networks.  However, this approach has been criticized because it provides ‘limited detailed explanations of the content of relations and what goes on in and between connections’ (Jack, 2010 p.120). In line with our research design, we employed qualitative network analysis (Luxton and Sbicca, 2020). Unlike quantitative network analysis, which often uses mathematical and statistical measures to study network structures and configuration, we focused on an in-depth understanding of interactional processes, inﬂuences, and behaviors of digital entrepreneurs in their social networks.

Moreover, our study of digital entrepreneurs currently operating and being engaged in multiplexed networks both online and offline is presented with the research challenge of both gathering retrospective data and attempting to get participants to segment their recollections into two separate, but inevitably intermeshing areas: online and offline networking. In the research protocols, we focused on gaining data from participants in this area and then, through supplementary questioning, clarifying which events belonged in which category and if there was the subsequent impact in different network domains.

3.1 Participants

We employed a purposeful sampling technique to recruit potential participants in our interviews. Suri (2011) supports the use of purposeful sampling in studies where the objective is to explore emerging practices and new technologies. The purpose of our purposive sample was to collect a variety of perspectives from diverse digital entrepreneurs, as well as to investigate whether the emerging constructs indicated any variations based on entrepreneur characteristics. To this end, and to capture a range of perspectives within our research focus and to ensure that we gathered data from participant engagement in diverse social network groups, we followed the advice of Morse (2010) and limited our sample segmentation to five primary demographic criteria: metropolitan vs regional location, gender, age, size of companies, and business maturity. However, in our subsequent data collection, we also explored issues of experience, education, and the industry sector with the participants. We were aware that any segmentation of the data would not be possible with such a limited sample, but we would be able to explore if there were any significant variations within the emerging major themes that related to the characteristics of the participant group. Although it was not possible to find equal numbers of digital entrepreneurs in all categories, this approach gave a qualitative appreciation of a broad range of entrepreneurs and business types. To obtain rich data and capture a range of views from people with different backgrounds and experiences, we set five demographic criteria: metropolitan vs regional location (in Western Australia), gender, age, size of companies, and business maturity. This approach allowed us to get a qualitative appreciation of a broad range of entrepreneurs and business types. We used two ways to recruit participants for our interview. First, we conducted a website search for start-up businesses using the five demographic criteria and then contacted around forty companies by phone that fit the criteria. As a result, we recruited twenty-one digital entrepreneurs who agreed to participate in our interview. Second, we recruited 14 digital entrepreneurs from co-working spaces. All the participants were digital entrepreneurs and all used both online and offline social networks, although their use and emphasis on those networks varied. The inclusion of co-working spaces in our search was motivated by the fact that co-working spaces, as a new type of workplace, have grown rapidly in Australia over the last five years (Office Hub, 2018) and have become a popular workplace for freelancers and digital entrepreneurs because they provide several benefits such as a community environment, networking, and mentoring opportunities (Nathan, 2017). The recruitment of digital entrepreneurs from co-working spaces also provided us with the opportunity to study the role of offline social networking in the digital entrepreneurial process. As Allen (1984) indicated, the transmission of useful technical information decreases as physical distance increases. Allen's curve (1984) indicates that within a coworking space, entrepreneurs are within the critical 50 metres of all their potential collaborators and can link into flexible groupings within a ten-metre diameter that paces them in the proximal zone for instrumental information transfer.

Among the thirty-five digital entrepreneurs we recruited for this study, there were digital business start-up founders and owners (86%), and digital business managers who hold equity in the start-ups and were involved significantly in the setting up of the companies (14%). As argued by Mays and Pope (1995), in qualitative research (statistical) representativeness is not a prime concern, when the objective of the research is to understand social processes. This is particularly relevant to our study which seeks to understand the social interaction process in entrepreneurial networks. By recruiting participants with diversified backgrounds and rich entrepreneurial experience, we were able to capture a more holistic picture of the phenomenon under investigation.

As shown in Table 1, the thirty-five interviewees were running and managing a total of forty-five businesses that used social media and other digital platforms as a core part of their businesses. Participants were more often males (86%), located more within regional (56%) than metropolitan (44%) areas, the majority (63%) of them had a university qualification and 77% of them had two or more entrepreneurial experience. Their businesses tended to be small (less than six employees), with only 2 classified as medium (having over 35 employees by Australian classification). These businesses were a mix of start-ups and mature businesses, as categorized by the participants, and most (80%) had been established for two or more years and 26% had been in operation for over 10 years. The businesses operated across multiple industry sectors. Business services, including website design, online marketing, and business development services, were easily the largest sector represented, followed by the IT sector.

**[Please insert Table 1 about here]**

3.2 Interviews

Semi-structured interviews were conducted with the participants to provide consistency of questioning across interviews while having the flexibility to explore areas of interest in greater depth. Twenty of the interviews were conducted face-to-face with participants in their workplace (i.e. offices, meeting rooms of co-working spaces, and coffee shops) and fifteen were conducted via Skype either due to the travel distance or according to the preference of the participants. The interviews were carried out over three months, between June and September 2017. Interviews took between half an hour and one and a half hours, with an average of around 45 minutes. All interviews were tape-recorded and transcribed for analysis. To ensure research integrity, ethical clearance for this study was obtained from the Research Ethics Committee of the university with which the authors are affiliated.

Our semi-structured interview questions aimed to capture a wide range of digital entrepreneurs’ experiences, with responses to questions involving social interaction being the focus. The questions asked explored how the social networks of the participants influenced them in various phases of their new venture development (e.g. opportunity recognition, skill and resource acquisition, start-up, and scaling-up), and how digital entrepreneurs leveraged their online and offline social networks to develop and support different aspects of their ventures. Therefore, we focused mainly on:

* How did digital entrepreneurs use social networks, online and offline, to build their knowledge, skills, and abilities?
* How did digital entrepreneurs use social networks, online and offline, to start and develop a digital business?
* How did digital entrepreneurs use social networks, online and offline, to create new/modified products/service offerings for customers?

3.3 Data analysis

Our data analytic strategy is based largely on grounded theory methodology (Glaser and Strauss, 1967). As an inductive qualitative study, as Merriam (2009 P13-17) indicates, our goal was to generate an understanding of how digital entrepreneurs made sense within their worlds, gathering descriptive data to explore not to prove, interpreting their experiences, and using researchers as the primary investigative instruments. However, as such a process is always about data reduction, to ensure a systematic and structured approach to our qualitative data analysis, we adopted the data analysis process of Gioia et al. (2013, p26) to ensure a  ‘systematic rigor in conducting qualitative, grounded theory research’, and that would simultaneously enable us to demonstrate the evidence trail from participant perceptions to new relationships within the data. Gioia produced a ‘staged’ analysis process for grounded approaches to qualitative analysis to prevent criticisms that findings were the result of a researcher’s whim, supported by cherrypicked quotations. The methodology is ‘specifically designed to generate grounded theory…a statement of concepts and their interrelationships’ (Corley and Gioia, 2011, p12). However, as Eisenhardt et al (2016) have indicated, there is a difference between rigor, and rigor mortis and analytical, qualitative frameworks should be just that, frameworks for analysis that are formed around the unique needs of each study and data set.

Our process followed the Gioia structure and began with 1st-order analysis, 'which tries to adhere faithfully to informant terms' and researchers do not attempt to 'distil categories', reducing the participants' voices into concepts, and then to a compendium of first-order terms. This was followed by 2nd -order analysis which identified similarities and differences among the emerging categories to produce ‘2nd-order theoretical level of themes’ and ‘ 2nd-order aggregate dimensions’. Finally, drawing on 1st-order terms or concepts, and 2nd-order themes, and aggregate dimensions, we constructed the overarching themes into a 'data structure' (see Figure 1). This data structure allowed us to think about the data not only methodologically but also theoretically because it not only clarified the essential concepts, themes, and dimensions were, but also the relational dynamics between those concepts. This is particularly instrumental to our research because we sought to understand how a particular representational category, such as relational or cognitive social capital, developed digital entrepreneurs and their ventures. All members of the research team conducted interviews and then highlighted interview transcripts with key concepts and terms (i.e., first-order coding). These concepts were then jointly analysed by two researchers to identify themes (i.e. 2nd-order analysis) and aggregate dimensions. In analysing the data, we identified the relationships broadly between social networks and social capital, as well as, specifically between and across different social network levels and different social capital dimensions. Responses referring to interactions with family members, business partners, staff, customers or clients, suppliers, other entrepreneurs, funders, mentors, and co-working space members were closely examined. In addition, participants often provided links to their websites or to influential online sources of information on developing digital start-ups. This body of knowledge provided a rich source of background information that helped us better understand the participant perceptions. Figure 1 presents our data structure and an overview of our data collection and analysis process. Our 'Gioia' diagram (Figure 2), which follows this section, is a simplification of a complex process, and, as Gioia himself stated (Nag, Croley, Gioia; 2007), can only ever be a static and logical representation of what is invariably a dynamic and iterative analysis process, involving both disciplined assessment and moments of insight.

**[Please insert Figure 2 about here]**

1. **Findings and discussion**

In this section, we present our interview findings and use the theoretical framework in 2.3 of this paper to frame our discussion in terms of personal networks, business networks, and societal networks. Furthermore, we present and discuss our key observations from our findings on online social networks and social capital versus offline social networks and social capital. It is significant that the data is derived from Western Australia (WA), as entrepreneurs that are located in WA have in the past two decades moved from some of the most geographically isolated to well globally connected as the internet has expanded digital reach and the isolated WA economy has continued to thrive during the global pandemic.

4.1 Personal networks

We found in our interviews twenty-two instances of illustrations of personal networks that digital entrepreneurs used and built in their efforts to develop their capabilities. Such personal networks were mainly composed of family members, friends, and educational and mentoring connections that enhanced these digital entrepreneurs' personal capability, venture knowledge, and project management skills. These personal networks and connections were seen to generate the structural dimension of social capital, that is, ‘who you reach and how you reach them’ (Nahapiet and Ghoshal, 1998 p. 244). For example:

My Dad built a couple of businesses along the way – it [DE] was in my family. I have just finished an MBA. *Thought* I might have to try this on my own.

I don't think you will ever see a digital entrepreneur reading the Courier Mail or the Australian. To see what's going on in the world, they will leverage their friends and influencers with *Headlines* that need sharing to get news and market intelligence. They are far bolder in asking industry gurus, high-level investors - far bolder in approaching key influencers or key people who can help.

     The personal networks were seen as fundamental in building digital entrepreneur's knowledge, skills, and abilities and instilled a desire for digital entrepreneurs to be resilient and self-managing to engage with problems. We noted that in the start-up phase, the close relationships of digital entrepreneurs with experienced mentors, partners with complementary skills, and emotional support helped sustain entrepreneurs and bridge their capability gaps. In this regard, personal networks create a relational dimension of social capital, namely, the trust and trustworthiness among friends and mentors. This finding broadly supports Aarstad et al. (2010) and Khoury et al.’s (2013) assertion that social relations provide relational social capital. Mentoring relations were noted as being important to not only help in sharing and transferring knowledge but also help deal with the isolation that digital entrepreneurs often experience. Communication with others essentially provided the needed emotional support and further fuelled some of the digital entrepreneurs’ motivation during the often long and hard journeys of digital entrepreneurship. Sixteen of the digital entrepreneurs whom we interviewed had their offices located in co-working spaces and viewed these as an important environment to share and engage with ‘like-minded’ entrepreneurs and to create and expand their personal social networks. This finding suggested that the cognitive dimension of social capital is needed and can be accrued from personal networks. One of the digital entrepreneurs told us:

Co-working spaces break the isolation and link you with stimulating, interesting bright people with face-to-face contacts. Your colleagues and mentors help shape and refine the model; this sustains you in the cash burn and long lead times. *Co-working and mentors build your capability development.*

  Our findings suggest that personal networks make an important contribution to a digital entrepreneur’s capability building, particularly in terms of mentoring and emotional support. We found that the personal networks of our participants led to improvements in all three dimensions of social capital. However, our findings also suggested that there were complex interrelations between the three different dimensions of social capital. For example, our participants gained emotional support and a sense of belonging to a community (i.e. an indication of cognitive social capital) thanks to the relational capital they had developed with their personal networks. On the other hand, the personal and mentoring connections (i.e. an indication of structural social capital) of our participants helped generate cognitive and relational social capital in the course of their capability building. The finding provided empirical evidence to support the research into the interrelationships of the three social capital dimensions (e.g. Muniady et al., 2015).

4.2 Business networks

Our findings suggest that, as in the case of personal networks, business networks also contribute to the structural dimension of social capital that was utilized by the digital entrepreneurs interviewed to start and develop their ventures. Sixteen participants commented on their constant search to build and maintain their business networks with governments, financial institutions, and even within the digital open innovation hubs. For example:

I am running a digital business so I can live wherever I want. *Not only has social connectivity fuelled entrepreneurial relationships but it has extended the reach across borders and time zones.*

The increasing pervasiveness of social media provides entrepreneurs with abundant opportunities to grow business networks often beyond borders because online social network configuration is often open, unrestricted, and transparent (Smith et al., 2017). One of the key drivers for developing and expanding business social networks was seeking the technical skills and business expertise for venture building, according to twenty of the participants we interviewed. Two of them put it this way:

*I*, in fact, have no technical skills whatsoever, but I know where and how to source the right people to help with my start-up in every aspect.

My strategy was to build my network in my fields of expertise as much as I could… I'm using it to sell something, but I'm also using it to learn something. [It] allows you to make informed decisions.

  Furthermore, twenty participants shared the same view that it was imperative to establish a sharing culture and have common expectations to be able to work together and collaborate, an indication of cognitive and relational dimensions of social capital. Digital entrepreneurship can be exhilarating, with digital entrepreneurs noting that they are empowered by a feeling of being able to make a difference through their business. The business networks and social interactions with others provide them with a sense of belongingness and a ‘drive’ to speed up their business success.

So, you get a culture, serendipity, community, and even with co-working in general, it’s not about the facilities, it’s all about the people. You want people who are of that same philosophy of sharing and helping each other. Obviously, you’re not sitting down and working with each other for an hour, but you’re free to give a word of advice, conversations will happen, you’re not inconveniencing them ... you feel like a peer. That’s where co-working fits in as well.

  Some research shows that seeking similar entrepreneurial attitudes and building strong business ties are the main reasons that digital entrepreneurs join offline communities such as meet-ups and co-working spaces and other local community-based business groups (Bouncken and Reuschl, 2018). Our findings also shed further insight into entrepreneurs' motivation and intentions with regard to offline business networks. Similar to what we found in personal networks, the interrelationships between cognitive, relational, and structural social capital can also be seen in business networks.

4.3 Societal networks

In terms of societal networks, we focused on the social networks of customers because online customers are the most important stakeholders of digital businesses while acknowledging other actors in a wider community are also part of a broader societal network. Social media opened new opportunities for digital entrepreneurs to connect with their potential and existing customers at a high speed and on a large scale. All of our participants (thirty-five) used social media to promote content, engage with their customers, get business information, and get involved in online conversations. Societal network relations thus enabled the formation of structural and cognitive dimensions of social capital. Two of the digital entrepreneurs illustrated their experience of leveraging social media to promote their products in this way:

The customer feedback chain using social media is almost instantaneous – that’s what is different. You can change products quickly – the feedback loop can be daily and impact product design.

What you find with social media is that it isn't so much a generator of sales, but it certainly builds up awareness and connection.

Twenty-eight participants shared the view that social media facilitated effective customer relationship management, which could lead to the relational dimension of social capital. Twenty-five of them used customer feedback from social media to test their ideas for innovation. Such networks further enable digital entrepreneurs to build not only an initial customer interest but also engage and build relationships and trust with their potential customers. The trusting relationships between digital entrepreneurs and their customers enabled product development and customization that further enriched the relationship. Here are two representative comments.

As an agency, we use all the social media to experiment with, because from a business perspective, we need to understand how it works for clients. We use platforms like Twitter to network and self-promote and to tell our ongoing stories to give frequent updates.

To find strategic business relationships and customers who are going to pay $40,000 to develop another App for them for their own region, you're going to have to have a long-term relationship with them.

We noted in our interviews that fourteen entrepreneurs were using social media to target clients and other external partners who shared expectations and beliefs in their business. One of them told us in this way:

Our online model fits well with our values of giving people choices. We only provide them [customers] with the service they need rather than pushing a package. That's the way we all want to work. It sits best with us.

  This indicated a cognitive dimension of social capital by which digital entrepreneurs could inform the market about their products, services, and their value creation. We posit that this was particularly important as the market was often not ready for, or not well-informed about new product/service provisions. The following quote illustrated this further:

So as far as using digital technology for something that's never been done before - we are actually building something completely new and we are having to educate our clients about the benefits of doing business differently from what they've been doing over the past many years.

  In the societal networks, we found that our participants were more inclined to leverage online social networks than offline social networks to act as a facilitator to reach out to their customers. This networking behavior reflects the unique context and nature of dynamic digital networks which has been a focus of some extant studies (e.g. Smith et al., 2017; Srinivasan and Venkatraman, 2018).

Overall, our findings demonstrated that the digital entrepreneurial process was underpinned by pervasive networking in three levels of social networks. The findings suggested that structural social capital provided the resources in terms of key groups of relational contacts who facilitated capability building, venture building, and customer market building. Relational social capital provided a foundation of trust between the entrepreneurs and their network members, which highlighted the strategic role of social networks in digital entrepreneurship. Cognitive social capital provides mechanisms to form relationships based on values shared across social networks.

4.4 On-line social networks/social capital versus off-line social networks/social capital

There is an emerging theme in the current literature exploring how entrepreneurs accrue social capital in online social network settings and how it might be different from offline settings. For example, the study of the online social networking behavior of entrepreneurs by Smith et al. (2017) suggests that the unique technical capabilities of social network sites have changed entrepreneurs' social capital behavior.

**[Please insert Table 2 about here]**

Table 2 presents a concise summary of the key observations that we made from our findings. These observations produced early evidence that in the multiplexed networking world, digital entrepreneur’s social capital accrual is generated from both on and offline social networks. Our study did not uncover any significant differences between the experiences and perceptions of different types of entrepreneurs, but it did reveal significant differences in how on and offline social network interactions impact entrepreneurs and their ventures. Social capital that is generated online is different from that generated offline and has a different impact on entrepreneurs and their ventures. Our observations suggest that social media has enabled the digital entrepreneurs we studied to multiply and diversify their online social networks, at a greater speed, and global. Participants voiced how they regularly contacted colleagues on other continents, how diverse their social media contacts were, and how feedback was a daily product from their social media connections that impacted on building their business and markets. In contrast, their offline networks were more locally based and often centred on co-working spaces. We found that these offline social networks and interactions were used more for building the personal capability of entrepreneurs. Participants indicated that their local social face-to-face contacts were 'their educational network', building their confidence and personal capability.

In terms of social capital types, we discovered that online social capital derived from networking in online social networks tended to be more structural than relational or cognitive, whereas offline social capital derived from face-to-face interactions in offline networks was more relational and cognitive than structural. The findings confirm and extend the notion that social network access to social media sites is reconfiguring entrepreneurial activities in terms of building social networks (e.g. Fischer and Reuber 2011). Social connectivity now pervades each component of venture building (Dodd and Anderson, 2007) and social media sites provide limitless spaces and scale for peer and customer engagement.

However, we also noted that there was a consensus among the participants that offline (or face-to-face) networks were often as important as online networks. Moreover, we also noticed that offline networks were often constructed from, and then developed towards, online relationships. For example,

I travel a lot for contacts. Even digital entrepreneurs need to have personal relationships. They can have digital relationships, but often the relations need to start face to face, then can continue digitally. I think to be digital you still need to have face-to-face contacts.

They held the view that face-to-face networking with partners, suppliers, and other business contacts facilitated the development of trust, and believed that this trust was increasingly difficult to build in the digital world, as the following comment illustrated:

Establishing trust is the main barrier to telecommuting - the technologies allow it these days, but we are still people who have relationships and we like to talk to each other face-to-face and build trust. It's difficult to do that remotely.

  These findings suggest that digital entrepreneurs utilized both online and offline social networks and acquired relevant social capital from both network sources. Therefore, studying the social networking of digital entrepreneurs needs to consider both online and offline contexts to capture a comprehensive picture. We reviewed the emerging constructs from the completed Gioia analysis in terms of the demographic differences between participants, e.g. gender, age, venture maturity. We found no significant differences were visible within our sample in terms of age, gender, or experience that warranted further research. Due to the limited number of participants in the study, it was not possible to segment and analyse smaller groups of participants.

1. **Main contributions**

This study contributes to the extant literature and practices in four ways. First, it contributes to current understanding and research on digital entrepreneurship as a new dedicated research stream of entrepreneurship. The focus of the current body of literature has been placed mostly on digital technology innovation (Berger et al., 2019). In contrast, we study DE from a social and network relational perspective. Smith et al. (2017) for example, highlight that social networking via social media enables the creation of online social capital where users are able to search, signal, and socially interact with others. Similarly, in the offline context such as co-working spaces, digital entrepreneurs are more likely to gather information and resources when they interact with others (Davidsson and Honig 2003; Allen, 1984), and from more intense relationships (Allen, 2016). Our findings provide further evidence to demonstrate that individuals with common visions, expectations, interests and goals are more likely to share knowledge, not only in the offline context but also online using social media or blogs (Chai et al. 2011; Allen, 1984). Thus, we shift attention away from the technologies that enable DE to the ensuing social connections in the process of DE. The digital entrepreneurs in our interviews were very vocal about how their personal network built their own capability and sustained them personally through periods of what may have been intense digital isolation. These relationships were often the conduit to the subsequent business partnerships that often bridged distances and traditional relationship roles, disrupting previous limitations by bringing in new resources. Social media interaction with the market to engage, educate, and supply transcended local face-to-face relationships. We found that personal networks of digital entrepreneurs, including family ties, led to the generation of important resources for building the entrepreneurs' knowledge, skills, and abilities, and in some cases, these were crucial for emotional support. As Gloor et al (2018) have suggested, it was not the size of their network but the instrumentality of specific relations that was important. Business networks provide relationships or partnerships with other entrepreneurs or knowledge providers that aid the development of new products or services and new business models. Broader societal network relationships with customer communities helped establish market interest and facilitate engagement with potential and existing customers. In terms of knowledge expansion, this study not only demonstrates the importance of studying digital entrepreneurship from a social network perspective, but also provides evidence to support the assertion that online interactions primarily build the business, while offline interactions primarily build the entrepreneur.

Second, although our study builds on the already established relationship between social relationships and small business entrepreneurship, our study contributes to a greater understanding of how digital entrepreneurs leverage social networks in today’s digitally connected society. Our study confirms the assertions by Smith and Smith, (2019) that entrepreneurs are not only utilizing their social capital in the offline context but are also increasingly dependent on building their social capital online. Our study extends understanding of this emerging existing theoretical relationship further by suggesting that digital entrepreneurs use online and offline networks for different purposes; business and self-development respectively. With the ubiquity of digital technologies, social networks in the digital age are taking on very diverse forms and changing rapidly. They are much more open, fluid with members opting in and out at any time, larger, and multiplex, with the activities within social networks often voluminous. The study of Steinhoff et al. (2019) indicates that social media can help manage relationships online as trust is built in these relationships. Interestingly, we found that although the digital entrepreneurs we interviewed relied on digital media and platforms to develop and get access to social networks, they also viewed face-to-face interactions with their peers and stakeholders as crucial to developing the relational dimension of social capital. It is important to note that our findings emphasize the continued importance of offline contact for digital businesses, reconfirming prior research, but we assert that digital networking creates a far wider social community for DE and expands the horizons and contact network for such entrepreneurs. Feedback from distant global customers can often be assessed at the close of each day, for example.

     Third, our study contributes to an ongoing debate on the constructs of social networks and social capital (Anderson and Jack, 2002; Gedajlovic et al. 2013) by extending our knowledge of how they mediate digital entrepreneurs and venture development. For example, some researchers consider that the structural dimension of social capital is the source from which relational and cognitive dimensions of social capital are derived (Gedajlovic et al., 2013). By incorporating the key constructs of both social network and social capital and looking into the interfaces between the two, we are able to demonstrate broadly how each level of social networks (personal, business, and societal) was associated with and generated, the three dimensions of social capital (structural, relational and cognitive), as well as the dynamics between the different dimensions of social capital and different levels of social networks (Kwon and Adler, 2014). Moreover, our findings indicated that digital entrepreneurs used social capital to develop new, and/or expand their existing, social networks, a two-way process. Our empirical findings should be able to trigger more research interest in understanding the dynamics of the relationships between social networks and social capital.

Finally, in addition to the theoretical contributions, our study provides practitioners and policymakers with an insightful examination of the crucial role of social networking in the digital entrepreneurial process. DE has been viewed as a critical pillar for economic growth, job creation, and innovation by many countries (ECEI, 2015). To boost DE for economic growth, an ecosystem that supports social network building is imperative and should be viewed as one of the strategic priorities of policymakers, given the social capital that is generated from the social networks online and offline as demonstrated through this study. According to our interviews, co-working spaces were a popular venue for digital entrepreneurs because they provided opportunities for community and network building among people with similar entrepreneurial mindsets, echoing Allen's 1984 findings of proximity being the instrumental factor for technical knowledge transfer. Supporting co-working spaces by governments could be a strategic move for DE growth. In today's sharing and digital economy, social aspects of sharing have become increasingly important because they help drive growth in the economy. How to build online and offline social networks that sustain social interaction and sharing is not only an important agenda for digital entrepreneurs but also for policymakers and other stakeholders such as peers and consumers. Our study helps to enhance the understanding of the nature, complexity, and instrumentality of social networks.

1. **Limitations and future research**

This is an exploratory qualitative study using a limited sample to explore the impact of social network interaction on digital entrepreneurs and their ventures, with the purpose of stimulating a social network approach when studying digital entrepreneurship. Future research can build on our theoretical framework and our findings to explore further the social networking that lies at the heart of digital entrepreneurial activities. First, while it is clear that social network relations affect digital entrepreneur’s capacity, it is difficult to conclude which relations, interactions, knowledge flows, and associations most affect the performance and outcomes of social networks for digital entrepreneurs. Some authors question the assumption that social networks necessarily produce social capital (Anderson and Jack, 2002; De Carolis and Saparito, 2006). Others urge researchers to address the negative implications of social capital (e.g. Gedajlovic, 2013) or the dark side of social capital (Kwon and Adler, 2014). The complex nature of social networks and social capital and their impact on DE development invites more conceptual development and empirical studies in this critical area. Future studies could focus on Allen’s curve (1984) and the relations between instrumental relationships and physical locations.

Second, it has been widely acknowledged that social capital resources are difficult to measure quantitatively because they are often highly contextualized, and/or it is impossible to attribute changes or outcomes solely to social capital resources (e.g. Adler and Kwon, 2002; Gedajlovic et al. 2013). This exploratory qualitative study aimed at a deeper understanding of the role of networking through investigating digital entrepreneurs’ experiences rather than measuring the properties of social networks and social capital. While our findings show how social networks were instrumental to digital entrepreneurs, we did not examine which network relations were most effective in each phase of the digital entrepreneurial process. Because of our purposive sampling strategy and sample size, we are unable to complete such testing or investigate whether age, gender, or venture maturity are significant factors. Future research could, for example, investigate further the intensity and effectiveness of networking at different levels of networks and different dimensions of social capital, while considering the dynamics of social networks and social capital as evidenced in our findings.

Third, the empirical insight from our findings indicates the interdependence that underpins the relationships between online and offline social networks and social capital. Further research is needed to understand how online and offline social networks are blended and how these blended networks are leveraged and lead to blended social capital while acknowledging the differences between the two. We consider that understanding the complexity of the changing nature of online and offline social networks and their interdependence promotes a holistic approach to studying the role of social networking in digital entrepreneurship.

Fourth, our purposive sampling strategy enabled us to collect rich data by interviewing people from various locations and backgrounds. It was therefore not our intention or focus to explore the differences and similarities among the 35 people we interviewed for this study. However, we hope that a quantitative approach could be taken in a future study to examine whether certain demographic factors such as geographic location and age influence how digital entrepreneurs use networks online or offline.

Fifth, we adopted a Ptolemaic view to this study to understand the role of networking from an entrepreneur's perspective as an insider as well as a central point of networks. This viewpoint differs from a Copernican viewpoint, which examines the network from an outsider's perspective and examines the entire range of interconnected networks and relationships. Research suggests that both a Ptolemaic and Copernican perspective is needed to provide a more rounded and robust investigation of structural and content aspects of networks (Jack, 2010). However, this would require a combination of quantitative and qualitative approaches. While our exploratory study with limited qualitative data was appropriate for pioneering the investigation of DE social networks, subsequent studies could take a quantitative approach as key variables in this field are gradually confirmed. Previous studies have indicated how proximity is critical in business social networks (Allen,1984) and this study has indicated how on and offline relations serve differing purposes. A social network analysis approach could be an appropriate future strategy for exploring how a DE's centrality within a network impacts on data received or how instrumental gatekeepers or brokerage are in bridging connections between DEs and their wider community (Wasserman and Faust, 1994). Social Network Analysis analyses a range of metrics about the relational ties in a social network, examining how well tied, how distributed, or how strongly connected a network is and how specific actors benefit or are marginalised by the network (Raisi et al, 2018). Such analysis might indicate what strategies were most appropriate for DEs to extend and maximise benefit from their network interactions. In addition, exploring the absorptive capacity of DE ventures might also indicate how network interactions impact business ventures (Zahra and George, 2002).

Last but not the least, this study relied on personal recollection of the digital entrepreneurs interviewed on their experiences with building and utilizing social networks in their entrepreneurial journey. Caution should be exercised regarding the accuracy of the recollection, especially in the case of those with a long history of being an entrepreneur. Caution should also be taken on the researcher biases as well as on participant biases that might affect the results of this qualitative and exploratory study. A quantitative approach with a large sample and detailed measurable variables could help improve the accuracy of recollection and reduce the biases from both researchers and participants.

1. **Conclusion**

This study seeks to explore how digital entrepreneurs utilize social networks to build their entrepreneurial capability, creating and developing business ventures in a digitally networked society. We argue that while the digital environment provides new tools that are continually reconstituting the entrepreneurial process (Nambisan, 2017), they are just tools. Our findings show that the social networking that these tools enable contributes the most to the changing nature of entrepreneurial behavior and activity in the digital age. The evidence from this study confirms and extends the concept advanced by Davidson and Vasst (2010) that digital engagement changes the focus of entrepreneurship to a practice that is highly dependent on building social networks. Digital engagement is therefore becoming a critical social construct for an entrepreneur's business development, while in contrast, offline social interactions mediate an entrepreneur's self-development. We hope that this study encourages and guides more research on this important but underexplored topic area, namely, the social aspect of digital entrepreneurship.

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**Figure 1** Theoretical framework

**Digital Entrepreneur’s Capability Building and**

**Venture Creation and Development**

**Social Networks**

**(3 levels)**

**Online & Offline**

**Networking**

**Online & Face-to-Face**

**Social Capital**

**(3 dimensions)**

**Online & Offline**

**Digital Entrepreneurial Process**

**Table 1.** Summary of individual profiles of participants and their businesses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Participant**  **profile** | **N = 35** | **%\*** | **Business profile** | **N = 35** | **%\*** |
| **Location** | Metropolitan | 46 | **Size (Employee)** | Sole operator | 29 |
|  | Regional | 54 |  | 2-5 | 43 |
| **Gender** | Male | 86 |  | 6-20 | 23 |
|  | Female | 14 |  | 21+ | 5 |
| **Age** | 25-40 | 60 | **Business Age (yrs)** | < 2 | 20 |
|  | 41-55 | 29 |  | 2-5 | 31 |
|  | 56+ | 11 |  | 6-10 | 23 |
| **Education** | School | 23 |  | >10 | 26 |
|  | Technical | 14 | **Business Stage** | Start-up | 37 |
|  | Bachelors | 43 |  | Mature | 63 |
|  | Postgraduate | 20 | **Industry Sector** | Agriculture and Resources | 5 |
| **Position/role** | Owner/founder  Co-founder | 86 |  | Business Services | 42 |
|  | Manager | 14 |  | Creative | 9 |
| **Entrepreneurial experience** | < 2 | 23 |  | IT | 17 |
|  | 2-5 | 22 |  | Tourism/Hospitality | 11 |
|  | 6-10 | 29 |  | Education | 11 |
|  | >10 | 26 |  | Health | 5 |
|  |  |  | **Business Type** | Business to business | 16 |
|  |  |  |  | Business to customer | 84 |

**\*Note:**Figures are *percentages* of demographics and businesses.

|  |  |  |
| --- | --- | --- |
| **1st-order concept** | **2nd – order theme** | **Aggregate dimensions** |

**Person networks** & personal bonds, resilience, trust, common value

* Family and friends’ influence and support
* Learning from mentors and peers
* Emotional support and encouragement means a lot to me
* My business relies on social media for almost everything
* Social connectivity fuels entrepreneurial relationships
* Co-working space builds culture, serendipity, community

**Business networks** & connectivity, technical skills, emotional support, community belonging



**Societal networks** & global reach, customer relationship building & feedback loop and co-design & dev.

* Customer feedback chain using social media is almost instantaneous
* We build a 2-way customer relationship on platforms
* Test and sell new ideas, new products/services on social media

**Figure 2 – Data Structure** (Adapted from Corley and Gioia, 2004)

***Note:*** SN = social networks; SC = Social capital; Dev. = development

**Table 2** Online social networks/social capital versus offline social networks/social capital – Key differences

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Social network**  ***Types*** | **Social network *Levels*** | **Roles** | **Social capital**  ***Types*** | **Social capital**  ***Dimensions*** |
| ***Online social networks*** | More at business & societal levels,  Less at personal level | More for venture building &  customer market building | Online social capital | More for structural capital than for relational & cognitive capital |
| ***Offline social networks*** | More at personal than business & societal levels | More for entrepreneur’s capability building | Offline social capital | More for relational & cognitive than for structural capital |

Source: Based on our interview data

**Appendix 1** Key interview questions

* Can you tell me about your networks? They could be personal, business and/or societal. How do you describe them?
* How do you use your online social networks (e.g. networks developed and managed mainly on social medias) and offline (face-to-face) social networks?
* In what way have your family and/or friends and/or mentors had an impact on you and your career life?
* How do you build your networks with customers, local community, suppliers, business service providers, funders/bankers as well as your business partners and colleagues? What are some of the main channels that you have used for this?
* How do you describe the role of your networks in your business (e.g. opportunity recognition, skill and resource acquisition, start up, scaling up, new/modified products/service offerings for customers, etc.)?

**Appendix 2** Summary of interview findings on the role of social networking in entrepreneur’s capability building, and venture creation and development

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Levels of Social networks** | **DE Activities** | **Key Themes** | **Dimensions of Social Capital** | **No. (%) Interviewees** | **Sample Quotes** |
| **Personal**  (families, friends, mentors) | Entrepreneur’s capability building | Mentoring,  Shared vision and values | Cognitive | 22(63) | ‘Your colleagues and mentors help shape and refine the model; this sustains you in the cash burn and long lead times. Co-working and mentors build your capability development.’ |
|  |  | Network links | Structural | 22(63) | ‘With some networks from my co-founder and friends, we managed to leverage them locally and nationally for our start-up.’ |
|  |  | Emotional support, Trust | Cognitive & Relational | 16(46) | ‘Co-working spaces break the isolation and link you with stimulating interesting bright people with face-to-face contacts.’ |
| **Business**  (funders, incubators) | Venture building | Seeking technical skills & business expertise | Cognitive & structural | 20(57) | ‘I in fact have no technical skills whatsoever but I know where and how to source the right people who do to help with my start-up in every aspect.’ |
|  |  | Business connectivity | Structural | 16(46) | ‘I am running a digital business so I can live wherever I want. Not only has social connectivity fueled entrepreneurial relationships but it has extended the reach across borders and time zones.’ |
|  |  | Collaboration,  Knowledge sharing | Relational & Cognitive | 20(57) | ‘So you get a culture, serendipity, community, and even with co-working in general, it’s not about the facilities, it’s all about the people, you want people who are of that same philosophy of sharing and helping each other.’ |
| **Societal**  **(**customers) | Market building | Educating customers, Customer relationship building | Cognitive & Relational | 28(80) | ‘We are actually building something completely new and we are having to educate our clients about the benefits of doing business differently [online] to what they've been doing over the past many years.’  ‘To actually find strategic business relationships and customers who are going to pay $40,000 to develop another App for them for their own region, you're going to have to have a long-term relationship with.’ |
|  |  | Product/service development | Cognitive & Structural | 25(71) | ‘As an agency, we use all the social media to experiment with, because from a business perspective we need to understand how it works for clients. We use platforms like Twitter to network and self-promote and to tell our ongoing stories to give frequent updates.’ |
|  |  | Shared expectations & beliefs | Cognitive | 11(31) | ‘Our online model fits with our values of giving people choices. We only provide them [customers] with the service they need rather than push a package. That's the way we all want to work. It sits best with us.’ |
|  |  | Social media as a communication, marketing tool | Structural | 35(100) | ‘The customer feedback chain using social media is almost instantaneous –  that’s what is really different…. You can change products quickly, the feedback  loop can be daily and impact on product design.’ |