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A Taxonomy of Social-Network-Utilization Strategies for Emerging High-Technology Firms

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Abstract: Lack of network transparency limits entrepreneurs' effective utilization of their networks for resource acquisition. Virtual platforms (e.g., SNS-Social Networking Sites) have the potential to leverage entrepreneurial networks. The purpose of this study is to understand why and how technology-based entrepreneurs use social media to effectively access resources and, in turn, shed light on how they overcome network transparency in the early stages of their new venture formation process. Through in-depth interviews with the (co-) founders of 18 technology-based start-ups, this work reports a four-way taxonomy of strategic use of SNS. This research provides new theoretical insights for the technoentrepreneurship literature and reports practical insights for entrepreneurs on how to use social media effectively. Furthermore, this work is a guide for future research looking at digital literacy in entrepreneurship.

Keywords: technology entrepreneurship; social network; digital skills; social media; qualitative research

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1. Introduction

Social networks of entrepreneurs play a crucial role in the success of new venture formation, as they provide access to resources such as key knowledge and resources or financial capital. Technology-based firms are not only handicapped by the dynamic and fast-changing environments they work in, but entrepreneurs are often in need of specific skills and knowledge that are scarce or difficult to obtain due to the uncertainty and newness of their market [1–4]. Thus, through their social networks, entrepreneurs have access to a specific and unique set of skills.

However, a lack of network transparency (such as visibility of who and what resources are available in their network) raises concerns in resource availability and, in turn, can obstruct resource access of those networks [5]. With the 4th industrial revolution, the digital affordances of some virtual platforms such as social networking sites have made it possible for individuals to leverage their social networks and overcome challenges to maintain and develop networks in their traditional form [6–8]. Despite this, our knowledge of how entrepreneurs undertake this task remains limited; see, e.g., [4,9–11].

The purpose of this work is to understand why and how technology-based entrepreneurs strategically use social media to effectively access resources in the early stages of their new venture formation process. This, in turn, brings key insights on how entrepreneurs enhance network transparency through digital networks and access resources that may be scarce or difficult to find and that can potentially handicap the emergence of their new venture.

The nascent knowledge in this research domain calls for an inductive research design. Accordingly, we conducted a series of semi-structured interviews with technology-based entrepreneurs to ascertain their perceptions and experiences related to their use of social media in the early stages of their new venture formation processes.

This paper is structured as follows. First, we outline the theoretical background of our work, including a synthesis of the role of social networks in the entrepreneurship literature and the recent work on the digital affordances of SNS. Second, we describe the methodology employed in our study including how data were collected and analysed. This is then followed by a discussion of our findings, that culminates with our proposed taxonomy on when and why entrepreneurs use SNS. Finally, we conclude with the key implications of our work for both theory and practice, acknowledge its limitations and define opportunities for future research.

2. Theoretical Discussion

Entrepreneurs are individuals who explore and exploit business opportunities [12–14]. The process of converting these opportunities into new ventures has been discussed by scholars as early as Penrose [15]. This process-based perspective of entrepreneurship has since been employed in numerous studies to understand the skills and resources required in the new firm formation process, e.g., [1,13,16]. These studies emphasize that market-based skills and resources can either be specific, such as business training or business services, or be generic, such as financial information or advice, and are commonly obtained through the individual's human, social and financial capital.

For new technology-based firms, the societal impact goes beyond profit and social benefits and involves technological change and growth. The dynamic and uncertain nature of these contexts stresses how the successful growth of the venture goes hand in hand with the entrepreneur's abilities to create an entrepreneurial team, obtain funding, validate their product, or prototype with potential clients, and recruit skilled employees [13]. Apart from the liabilities of smallness and newness faced by entrepreneurial ventures, the acquisition of resources is especially critical in technology-based firms compared to others, because the skills and knowledge required are scarce and difficult to acquire in the traditional marketplace [17,18]. Since the firm's social network coincides with the founder's network at the start of new firm formation, entrepreneurs who are well connected with a rich social and professional network will most likely experience more success in starting a new venture [1].

The entrepreneur's social capital is crucial to the entrepreneurial process, especially in technology-based contexts [3,19,20]. Social capital refers to the accumulation of networks and contacts developed in school, university, work, family, and so on, which: (1) facilitate the identification, collection and allocation of scarce resources and resource owners; and (2) provide easier access to information and reduce transaction costs. University contacts, for instance, can be particularly useful to access financial capital and or skilled labour, while connections in the industry are useful for commercializing products and gathering intelligence about the business environment that can lead to business growth [3].

In the early 2000s, most research on entrepreneurial networks focused on Granovetter's [21] dichotomy of weak versus strong ties. After decades of intensive research, there is no agreement on what type of network structure is more beneficial for entrepreneurial endeavour [16]. In contrast, most research agrees that high-quality networks comprise a variety of relationships, and that network diversity is central for performance increases. Thus, a successful network requires a balance between size and quality, in other words, a balance between the structure—defined by "who" is in the network, and the content—defined by "what" is in the network [13,19]. Moreover, social networks are not static but evolve over time to address changing resource needs [13]. Network development is essential during the entrepreneurial process and is higher when the entrepreneurs' network structure and content is limited [19,22].

The literature introduces time dependency to social networking by suggesting that entrepreneurs establish, maintain, and expand their social networks over time, hence adding, upgrading, and dropping ties [23]. Beyond their strong and weak ties, entrepreneurs manage both their latent ties (dormant ties that might be reactivated) and potential ties (with potential for further development) to overcome network overload and redundancy [22,24]. Furthermore, the entrepreneur's networking style encompasses: (1) network-deepening actions within their existing relationships; and (2) network-broadening actions to extend their ongoing network [3,24].

Successful management of social networks is crucial for resource acquisition. Problems such as limited network transparency can inhibit the entrepreneur's ability to deploy the social network during the new venture formation process [5]. A lack of network transparency can, for example, lead some entrepreneurs to perceive that more and better-qualified human capital may be found outside of the network, or that the amount and quality of funds from a social network are limited. Recent work has nevertheless underscored the capability of SNS to enhance network transparency and, in turn, offer new opportunities for entrepreneurs to manage their social capital [6,25].

2.1. Social Networking Sites

The study of the impact of virtual platforms upon entrepreneurial outcomes has received special attention in recent years [9,20]. Scholars have broadly looked into the entrepreneur's adoption of the internet and social media during firm formation and growth, e.g., [26–29]. Some of the most popular SNS include Facebook, Xing, Twitter, Google+ and LinkedIn [26,30]. Among this group of widely used SNS, LinkedIn is popular for maintaining and developing professional connections, while Facebook provides perceived (informal) support such as through companionship, and Twitter is used to analyse the entrepreneurs' social network and firm performance [31–33]. Different SNS may serve different purposes, and individuals can use them differently to manage their personal and/or professional relationships [31,34]. Most relationships are conducted in more than one medium, which most of the time remain complementary. Song [32] identified that the entrepreneur's virtual social contacts in different SNS overlap more than do those of other individuals. These properties may serve to confound measures of the impact of SNS on firm performance.

While benefits can accrue from effective entrepreneurial networking, low network transparency, due to limited information about resource availability within the entrepreneur's network or direct connectivity between the entrepreneur and the resource owner, can obstruct resource exchange. SNS provide what has been called "digital affordances" [25], such as: (1) shareability—the ability to share profile content with many others; (2) searchability and persistence—the ability to efficiently search for content such as personal profiles, status updates and activities of individuals on site; (3) social interactivity—the ability to connect to networked others; and (4) visibility and association—the ability to make all network connections visible to the network owner as well as to know the network activity and connections of related others. It appears that, through their digital affordances, SNS are useful for maintaining and developing social networks, as they enable a common medium to search for users, to browse new contacts with similar interests, get advice from peers and to intensify latent ties into weak ties [35,36]. In turn, entrepreneurs have an opportunity to improve their network transparency through the digital affordances of SNS [31,37].

While network transparency can represent a barrier to use social networks for resource acquisition, it seems that entrepreneurs can greatly benefit from the digital affordances of SNS to improve network transparency, and, in turn, enhance their social capital [25]. However, the study of entrepreneurs' usage of SNS is still very recent and scarce, and not much is known about what strategies entrepreneurs employ to effectively use SNS during their new venture formation process.

2.2. Social Media Adoption and the Uses and Gratifications Theory

Entrepreneurs' use of social media has received significant attention in recent literature due to its potential to support business success, e.g., [20,38,39]. The entrepreneur's adoption of social media has a dual perspective: the individual focus and the business focus [40];

and theoretical approaches such as the UTAUT model, Diffusion of Innovations theory or the Media Richness theory have been useful to explore the entrepreneur's adoption process of this media. For example, using the lenses of the UTAUT model, Puriwat and Tripopsakul [39] showed that the entrepreneur's adoption of social media is driven by their performance and effort expectancy, while Mandal and Queen [41] used the Media Richness theory to explain the characteristics of different types of media in the adoption process.

A remaining question in the use of social media is why and how entrepreneurs use these new means to network and access resources. In this vein, and complementary to the above theories, the Uses and Gratifications Theory has been used for decades to explain the user's motivation to utilize specific media to meet specific gratifications [42,43]. In other words, this theory suggests that users play an active role in choosing media that depends strongly on the social interaction, informational and entertainment gratifications they expect to get out of it [40]. Moreover, the Uses and Gratifications Theory is effective in understanding the adoption of several types of media and has been used to explore traditional media such as radio and television, as well as contemporary media such as the internet, online games and social media [44]. In these cases, the user's decision regarding adoption is based on the satisfaction and enjoyment that either the contents of the TV show or the design of the web site can generate on the user. The Uses and Gratifications Theory has also been used to study why and how specific individuals (e.g., senior people) use social network sites [43], or how social media platforms can fulfil different purposes [44]. Furthermore, this theory is complementary to other user adoption-based theories such as Rogers' Diffusion of Innovations [45], or Venkatesh et al.'s UTAUT [46] in understanding their adoption decision process [40].

In this study, we propose that entrepreneurs using SNS will benefit from the affordances of these digital settings to enhance network transparency and, in turn, successfully manage their social network during the new firm formation process. To assess these affordances, we employ a Uses and Gratifications approach which assumes that a user (in our case, the entrepreneur) has motives for turning to certain types of media and, subsequently, that this user expects to fulfil specific outcomes through the interaction with that media [47–49].

3. Methodology

Despite the extensive amount of research on the role of social networks in the entrepreneurial process, our understanding of when and how entrepreneurs use SNS is limited. The nascency of this research field guides us towards a qualitative methodology [50–52], which will concurrently generate new theory emerging from the data [53,54].

3.1. Sampling

Participants were recruited at a technology-based start-up networking event in Barcelona (Spain) that hosts the 50 most successful newborn start-ups, and where these emerging ventures are showcased to 50 investing entities. During the event, the researchers approached the entrepreneurs and invited them to participate in the research project. The researchers then collected some basic information about the new venture, the entrepreneurial team, and the social media portfolio of the entrepreneurs who were willing to participate in the study. Specifically, the information gathered included growth measurements of the venture, including number of employees, number of sales, and rounds of investment; the structure of the founding team and their key responsibilities; and a list of the key SNS profiles (for both the venture and the main founders).

Ideal respondents included entrepreneurs who were involved in start-ups less than four years old at the time of the interview, but who were also in an emergence stage, meaning that the ventures had already recruited employees, commercialized their products, and had at least obtained a first round of investment. Regarding the entrepreneur, we accepted different educational and professional backgrounds in order to obtain variability in their initial network structures and skills. We also distinguished between past entrepreneurial attempts and prior industry employment experience, since the network formed in prior experience may differ from the ties or connections required by the industry of the new entrepreneurial venture. Further, we ensured that not only the venture, but also the individual entrepreneurs interviewed, had social media profiles and were active in at least one of the three main SNS (i.e., LinkedIn, Facebook and Twitter), thus allowing for reflection upon their own experiences.

In total, 18 start-ups were selected and a total of 19 interviews were conducted (two entrepreneurs belonged to the same start-up but were interviewed separately given their complementary roles in the firm). A detailed description of the final sample is presented in Table 1, including the code name for the entrepreneur interviewed, age, Industry & Technology of the start-up, respondent's role in the new venture, educational background (defined as technological, business, or other), prior entrepreneurial intent (yes or no), and prior exposure to the industry (yes or no).

Table 1. Respondent details.

Respondent	Age	Industry/Technology	Role	Formal Training [1]	Prior Ent. Expertise	Industry Experience
E01	32	Healthcare/Sw App	Co-Founder	Other		
E02	47	Non-Profit/eComm	Founder	B.A.	Yes	
E03	51	Entertain/Sw App	Co-Founder	Tech	Yes	
E04	35	Photogr/Sw App	Co-Founder	Tech	Yes	Yes
E05	36	Buss Serv/eComm	Founder	B.A.		Yes
E06	44	Tourism/Sw App	Co-Founder	Tech	Yes	Yes
E07	42	Healthcare/Sw App	Founder	Other		Yes
E08	36	Telco/Hw & Sw	COO	Tech		Yes
E09 [2]	32	Logistics/Sw App	Co-Founder	B.A.	Yes	
E10	30	Sports/Sw App	Co-Founder	B.A.	Yes	
E11	28	Mass Media/Sw App	CTO	Tech		Yes
E12	33	Telco/Hw & Sw	Co-Founder	Tech		
E13	31	Mass Media/Sw App	Founder	B.A.		Yes
E14 [2]	31	Logistics/Sw App	Co-Founder	Tech	Yes	
E15	29	Entertain/Sw App	Co-Founder	Tech	Yes	
E16	40	Education/Sw App	Co-Founder	Tech		Yes
E17	29	Buss Serv/Sw App	Co-Founder	B.A.	Yes	
E18	42	Marketing/eComm	Founder	Tech		Yes
E19	38	Marketing/Sw App	Founder	Tech		

[1] Formal training has been classified as Business Administration or related (B.A), Engineering, Computer science, or other related (Tech) and other disciplines such as Medicine, Chemistry, etc. (Other). [2] Entrepreneurs belonging to the same firm.

3.2. Interviews

To ensure that the same information was broadly obtained from all the informants, the interviews were based on a semi-structured interview guide that was constructed with thematic headings derived from the literature review (following [17]). This approach allowed freedom for the interviewers to build a conversation with respect to the pre-specified themes. Within this framework, the interviewers developed a sequence of questions but took the liberty of following unexpected paths introduced by informant responses, deciding which questions to pursue in greater depth [55,56]. The guide was structured in three sections, the first containing an introductory section about the individual, and her/his role and responsibilities within the venture. The second section included questions addressing the motivations of the entrepreneur to use SNS (e.g., do you use social media for business purposes? If so, why? What platforms do you use to manage your social networks?). Finally, the last section aimed to discuss how entrepreneurs used SNS to manage their social networks (e.g., How is social media useful to you when building your new venture?). These two latter questions were designed following the uses and gratifications approach [47–49], used in similar studies on the motivations and benefits of social media and emerging technologies.

Interviews were conducted in two phases, allowing the researchers to introduce data analysis processes in between the data collection phases: first, a group of 6 interviews was conducted with polar cases based on the educational and professional backgrounds of the entrepreneurs, to establish a preliminary framework responding to the initial research question. Subsequently, 13 additional interviews were carried out to increase the variability of the results, until theoretical saturation was reached [53]. The interviews were conducted in Spanish or Catalan, according to the interviewee's preference, and lasted between 30 and 60 min. They took place at the university premises or in private locations in public settings convenient and familiar to the participants. Only one of the interviews was conducted remotely as the participant was out of the country during the interviewing period.

3.3. Data Analysis

Data were systematically collected and analysed following an iterative process of comparing the earlier literature, data, and emerging theory [54]. All recorded interviews were transcribed verbatim, and the interviewer compared the transcripts with the original recordings to confirm their accuracy. Additional notes were taken during the interviews and were transcribed to a research diary to keep track of emerging insights and reflections made by the researcher during the interview process. Transcripts and notes from the research diary were, in turn, coded and analysed for emergent themes [53].

Transcripts were analysed following an inductive-qualitative approach. The researchers coded the first six transcripts independently using open coding through key points and identified emerging themes. Then, they compared their findings and resolved any differences. Once an initial framework was developed, they analyzed the remaining 13 interviews using the same coding scheme that emerged in the first round of analysis. Regular peer debriefings were held throughout the coding and analysis process to discuss additional themes into the ongoing framework. This also allowed the researchers to bring multiple perspectives to the discussion and reach consensus on the interpretation of data. When new themes were identified, the coding scheme was modified, and previously coded interviews were reviewed and re-coded.

4. Findings and Discussion

All the entrepreneurs interviewed have a LinkedIn profile, and most of them claimed to manage these profiles frequently. Meanwhile, of the 19 entrepreneurs we interviewed, 17 additionally used Facebook while 16 used Twitter to manage their personal as well as their entrepreneurial networks. Interestingly, several of the entrepreneurs also identified MeetUp as a useful SNS to manage their social networks for entrepreneurial purposes.

On most occasions, it appeared that each of the SNS platforms were used for a specific purpose. For example:

> *"I use Twitter, Facebook and LinkedIn. While Facebook is a tool useful primarily for entertainment and to make personal contacts outside of the business, LinkedIn is useful to identify people who you can network with. Twitter is useful to create image or reputation, and thus position your brand."* (Entrepreneur 15)

> *"LinkedIn is the showcase of your professional identity. I mean, whereas Facebook is a platform for adolescents to "show off", LinkedIn enables professionals [to] show their achievements, the investments they have made, [and] their CV."* (Entrepreneur 5)

Entrepreneurs also differentiate between relationships taking place in the real world and which can potentially be extended to connections in SNS, and those that are initiated solely in the virtual world. SNS were therefore not taken in isolation and, in fact, on most occasions entrepreneurial ties coexist in both real and virtual spaces. At the same time, entrepreneurs use SNS strategically to manage their social networks. For example:

> *"We know many of the contacts we make on SNS as we have met them through entrepreneurial events for example, and this makes it easier to connect in SNS. LinkedIn and other SNS therefore facilitate what used to be difficult before-to store your contacts."* (Entrepreneur 6)

> *"Depending on the type of contact, SNS is more or less useful to connect to people we have not met in the real world. And also, the type of resource. For example, it is harder for us to connect to potential business angels than to recruit programmers."* (Entrepreneur 17)

4.1. Why and How Entrepreneurs Strategically Use Social Media to Manage Their Networks

Strategic networking is referred to when networking is conducted to achieve business success. The entrepreneurs we interviewed use SNS to strategically manage their social networks depending on their objective and their networking style. SNS were especially useful to manage entrepreneurs' social network because affordances such as shareability, social interactivity, searchability, persistence, visibility or association enabled entrepreneurs to search for personal profiles, status updates and activities of individuals as well as to connect to those users.

In line with the Uses and Gratifications Theory, we identified why and how entrepreneurs use social media in the early stages of their venture. Precisely, entrepreneurs who manage their networks through social media do so because they expect to gain access to resources in the form of new social interactions, information and external funds. Their expected gratifications varied depending on the main activities undertaken during the new venture formation process. In some cases, entrepreneurs conducted systematic networking activities on SNS with no specific purpose other than to enhance their social capital. In other cases, entrepreneurs used SNS to pursue specific resource challenges such as building a venture team, raising capital, recruiting employees, finding early adopters to validate products, accessing relevant knowledge, or establishing international contacts, and commercializing their products.

Our data also show that when entrepreneurs used social media to manage their social interactions they use either of these two networking styles: deepening and broadening their network. Deepening actions capture the interactions of entrepreneurs with contacts in their existing networks, to intensify these connections or make reconnections. SNS are particularly useful for facilitating deepening actions as they enable shareability, searchability and persistence. Broadening actions refer to the further development of the entrepreneur's existing network and include the search for new contacts through groups or keywords representing common interests. SNS also facilitate broadening actions by providing a common space for social interactivity, visibility, and association.

4.2. An Emergent Taxonomy of SNS Strategies

By considering the Uses and Gratifications in the context of entrepreneurs, we established a taxonomy that helps distinguish four different scenarios where entrepreneurs use SNS, as indicated in Figure 1. This taxonomy emerged through the Uses (entrepreneurs' networking style) defined through two sub-categories (deepening actions vs. broadening actions) and the Gratifications (the entrepreneur's networking purpose), also defined through two sub-categories (non-specific, systematic networking activities vs. specific).

As indicated in Figure 1, entrepreneurs employ SNS for Network Intensification when they conduct systematic networking activities through deepening actions. This mode of SNS employment takes place when entrepreneurs do not pursue a specific resource challenge, but desire, following a specific gratification for them, to stay connected with their existing social networks. For example:

> *"All the contacts I make are on LinkedIn, and it is really useful to maintain these connections with them. I regularly post news about my business or react to their posts to have them more engaged"* (Entrepreneur 4)

Whether the relationship was initiated online or offline, entrepreneurs take advantage of the digital affordances of SNS to virtually connect and interact with their strong, weak, and latent ties. When entrepreneurs engage in Network Intensification, they share information about their new venture's status to create awareness of their entrepreneurial achievements. With respect to the Uses and Gratifications Theory, this makes sense, because they believe that sharing relevant achievements about their new venture builds their credibility to fight against their liability of newness and smallness. A successful entrepreneurial network is defined by its size and quality. Entrepreneurs also respond to the posts of their contacts to strengthen their relationships. Overall, they accrue benefits from SNS, because they perceive it helps them to stay connected to their network and intensify ties therein. By intensifying the relationship with their contacts, entrepreneurs believe that, as a specific use of the SNS, they will be more reachable if needed later in the entrepreneurial process.

		HOW? Entrepreneurs' networking style (Uses)	
		Deepening actions	**Broadening actions**
WHY? Entrepreneurs' networking purpose (Gratifications)	**Non-specific, systematic networking activities**	Network intensification	Network extension
	Specific, purpose-driven activities	Resource-owner reconnection	Resource-owner browsing

Figure 1. Taxonomy of SNS Strategies.

Entrepreneurs employ SNS for Network Extension when they conduct systematic networking activities through broadening actions. Hence, Network Extension takes place when entrepreneurs do not pursue a specific resource challenge but, following uses and gratifications, use SNS to connect to potential ties with whom they might share some common interests. For example:

> *"Meetup is very useful to register in groups where you can find their ongoing activities and join them. (. . .) And you can find these types of informal profiles through Meetup."* (Entrepreneur 7)

When entrepreneurs engage in network extension, they take advantage of the digital affordances of SNS, and their interaction with entrepreneurs' uses and gratifications, to connect to potential ties through groups, communities of interests, and other means. Specifically, they benefit from the social interactivity and associative nature of SNS enabled by specific subgroups to build new connections with individuals with whom they share common interests. Moreover, while entrepreneurs engage in Network Extension, they do not pursue specific activities, but engage in these systematic networking actions, because they perceive that, by extending their network of contacts, they will achieve a bigger network they can access further in the entrepreneurial process (if needed), and will also gain visibility in a broader context.

Entrepreneurs employ SNS for Resource-owner Reconnection when they conduct specific, purpose-driven activities through deepening actions. In light of the Uses and Gratifications Theory, Resource-owner Reconnection takes place when entrepreneurs pursue a specific resource challenge (e.g., funding and recruitment), and use SNS to reactivate latent ties that have been dormant or inactive. For example:

> *"LinkedIn for me is like a card holder. All the contacts that I make are on LinkedIn, and sometimes when I have a need I go to LinkedIn and I search, and I find interesting things"* (Entrepreneur 13)

Even though virtual ties are easier and cheaper to maintain, both maintaining and developing social ties can be time consuming and entrepreneurs' latent ties are useful to overcome network overload and redundancy. When entrepreneurs engage in Resource-owner Reconnection, they specifically benefit from the searchability and persistence nature of SNS to search for suitable resource owners among their connections through personal profiles, status updates and past activity of individuals. When faced with a specific resource challenge, entrepreneurs usually prefer to work with someone they have worked with before. While in traditional settings entrepreneurs could find it challenging to obtain these resources due to limited network transparency, they are able to overcome this limitation by engaging in Resource-owner Reconnection through SNS, as the information about their network contacts is now searchable and persistent, and, in turn, easier to access.

From the last perspective of the uses and gratifications in this taxonomy, entrepreneurs employ Resource-owner Browsing when they conduct specific, purpose-driven activities through broadening actions. Resource-owner Browsing takes place when entrepreneurs pursue a specific resource challenge (e.g., funding and recruitment), but their existing social network is unable to satisfy those needs, which motivates them to use SNS to connect to potential resource owners. For example:

> *" ... I wanted to validate whether my product would be useful to the psychologists in America (...) so I did a search in LinkedIn (...) and I started sending emails to schedule meetings with them to expose my idea."* (Entrepreneur 1)

At times, entrepreneurs may fail to obtain resources through traditional social networks. Resource-owner Browsing provides an alternative way that entrepreneurs can acquire resources by pursuing the owner of the specific resource through SNS. When entrepreneurs engage in Resource-owner Browsing, they specifically benefit from the visibility and associative nature of SNS to search for personal profiles, status updates and past activities of the individuals based on resource challenges. They also benefit from tags and keywords as well as from searching among the visible social networks of their contacts to attain the needed resources.

4.3. The Dynamics of Social Networks' Management Strategies

Building on the recent and promising literature on social media as enablers of networking [4,8,9], and the perspective of the Uses and Gratifications Theory, our study shows that entrepreneurs use SNS when they seek specific resources, and alternatively use SNS more generally when they seek, for example, to promote their businesses, build trust and reputation, or keep social contacts "warm" in case these are needed in the future. In combination with these different purposes, there will be differences in their networking style (see Figure 2). Entrepreneurs with no specific resource challenge will indistinctively use deepening and broadening styles, thus engaging in Network Intensification and Network Extension. By contrast, entrepreneurs with a specific, resource-driven objective will first try to reconnect with their existing network—hence engaging in Resource-owner Reconnection—but will turn to exploring potential resource owners outside of their network through Resource-owner Browsing if they are unable to satisfy their objectives.

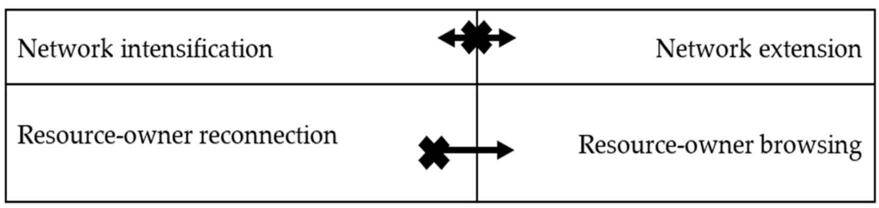

Figure 2. Dynamic interaction between strategies (arrows represent the direction of movement between strategies over time).

When entrepreneurs pursue a specific resource, they turn to their existing social network first (Resource-owner Reconnection), to find and reconnect to potential resource owners [23,24]. This happens because entrepreneurs prefer to work with someone with whom they have previously worked as it builds on and enhances the trust among parties. If a resource owner is not identified, entrepreneurs engage in Resource-owner Browsing as a way to identify potential ties through their connections or through keywords, tags, and communities of interest. In this endeavour, SNS provide significant potential for entrepreneurs to acquire resources, through the publishing and sharing of their profiles and searching for specific profiles with whom they want to develop a relationship. If entrepreneurs' social capital is not enough to fulfil their resource requirements, they will use SNS to search a broader network. For example:

> *"Usually, if you have direct contacts you don't use LinkedIn to find anyone else, but there are times when you don't know anyone in that particular field. Then you go to social media and search within different groups or search through your network's network"* (Entrepreneur 3)

By contrast, when entrepreneurs do not pursue a specific resource, they use SNS to conduct systematic networking activities and, in turn, they engage in Network Intensification (deepening actions) and Network Extension (broadening actions) interchangeably, meaning that they do not necessarily follow a specific sequence of actions. SNS are particularly useful as facilitating platforms where entrepreneurs can share information with their network as well as form connections with others through groups or communities of interest. Entrepreneurs specifically use SNS to interact with their network through posts, comments or status updates and engage in communities of interest to create new ties with whom they potentially have common interests. For example:

> *"Through Meetup you can do networking, which is what I was looking for. You have your network and you also meet with people with common interests, in my case people with an interest in social entrepreneurship, and you can share your goals or even your project, and you sometimes even receive feedback"* (Entrepreneur 2)

5. Conclusions, Implications, and Future Research

While technology-based entrepreneurs depend heavily on their social network for successful venture formation, network transparency on what resources may be available through their network is an important handicap in the early stages of their venture formation. Entrepreneurs using digital tools such as SNS can benefit from the shareability, searchability, persistence, social interactivity, visibility and association of these networks to interact, intensify and extend their current network. At the same time, SNS can help identify resource owners within their direct or extended network.

Through an inductive analysis of a group of technology-based entrepreneurs, we found that entrepreneurs actively use SNS. Their motives vary from systematic networking—where they maintain their network as part of their entrepreneurial role, to directed or purposeful networking to fulfil resource-driven objectives. Moreover, their networking style also varies depending on whether they intentionally aim to strengthen their relationship with current contacts or seek to develop new connections with potential resource owners. The foregoing analysis has culminated in a taxonomy of SNS management strategies through combining different dimensions of networking purpose and networking style. This taxonomy classifies the entrepreneur's strategical usage of SNS as: (i) Network Intensification; (ii) Network Extension; (iii) Resource-owner Reconnection; and (iv) Resource-owner Browsing.

5.1. Implications

This research posits key implications for both theory and practice. First, this work builds on the entrepreneurship literature and brings new lenses to the impact of digital networks on entrepreneurial performance, e.g., [9,20]. For instance, regarding the supportive networks of entrepreneurs, our findings show that when founders need specific resources they tend to rely, in the first instance, on their existing ties. It is only when they are not able to fulfill their resource gaps through their existing network that they will turn to developing new ties. This suggests that factors such as trust embedded in prior exposure and support from existing relationships or cost of developing new relationships prevails over one's opportunities to develop new ties to access resources.

Through our work, we also show that entrepreneurs' limited resources can be leveraged by strategic management of their virtual social networks. Thus, our findings contribute to the literature on dynamic networks and suggest that a static approach to the social capital of the entrepreneur is dated and does not take into account how the entrepreneurs' networks evolve over time depending on their resource needs and constraints [57–59]. Furthermore, in line with the competencies required to become an entrepreneur [60], we challenge that, in the context of the 21st century, social capital should rather be considered a commodity and that digital literacy may offer entrepreneurs tools to gain competitive advantage through building supportive networks.

Additionally, this work shows that entrepreneurs use SNS to both maintain their current networks and develop new ties [6] and how SNS affordances enhance network transparency and reduce information asymmetry in the context of entrepreneurship. In other words, the digital affordances of SNS facilitate the way entrepreneurs interact, intensify, and reconnect with their social ties (including latent ties) and how they identify and connect with new ties. This provides new insights on how digital affordances are key in network management and transparency. Furthermore, this provides additional insights to the Uses and Gratifications Theory regarding informational and social interaction gratifications of these media, and its applicability in the context of entrepreneurial adoption of social media.

Secondly, taxonomies are useful devices for theory building, particularly in areas where little is known about the phenomena under observation [61,62]. They represent a "first cut" at organizing knowledge about complex systems and serve to facilitate communication among researchers by using simple categorical names which bring to mind the complex combination of underlying factors in each cell of a multidimensional array. Taxonomies are particularly valuable for initially classifying inductively derived data before subsequent hypothesis development and quantitative analyses [63]. It is anticipated that the taxonomy developed in this study will provide a basis for further theory development about the strategic management of SNS and the impact of this on the success and growth of emergent new ventures.

Finally, beyond the theoretical implications of our work, our findings are very relevant for entrepreneurs and entities dedicated to support the emergence of new ventures. On one hand, and building on the insights from our sample, entrepreneurs may find that the current results provide relevant insights on why and how to use SNS and how to benefit from the digital affordances of SNS. Thus, entrepreneurs can benefit from the proposed taxonomy to identify how to enhance the use of SNS to build, maintain and coordinate their social network. On the other hand, the failure rate of new firms is notoriously high, the personal costs of entrepreneurial failure are painful, and the societal opportunity cost is significant [64,65]. By understanding how digital affordances enhance network transparency and facilitate the creation of new firms, our research encourages the development of supporting mechanisms for new firms that comprise virtual visibility and access to potential resource owners to facilitate suitable connections. As such, this study serves as a reference for policy makers, innovation advisors and technology developers who have an interest in supporting entrepreneurial emergence.

5.2. Limitations and Future Research

To conclude, we must recap on the limitations of this work, which pave the way forward for future work. First, our sample was comprised of technology-based entrepreneurs. This was a choice made based primarily on the resource constraints these entrepreneurs face as the resources needed in the early stage of their ventures are scarce and difficult to obtain. While the current results are limited to entrepreneurs working in technology-based settings, we suggest that future research explores the current taxonomy in other cohorts such as social entrepreneurs or family businesses.

Second, the current work studied how entrepreneurs use SNS to access resources through their social networks. This approach limited our focus to the singular point of view: the entrepreneur. Complementary research should explore why and how different types of resource owners (such as investors, skilled human capital, etc.) engage with SNS. This approach could also bring new insights into the effectiveness of the strategies employed, providing new insights on the digital skills entrepreneurs need to manage their networks in virtual environments.

Finally, due to the qualitative nature of this study and the associated size of our sample, our work was unable to test our taxonomy and validate these emerging factors with great certainty. It is anticipated that the taxonomy developed in this study will provide a basis for further theory development and we propose that further research employs quantitative methods to test the proposed taxonomy.

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References

1. Davidsson, P.; Honig, B. The role of social and human capital among nascent entrepreneurs. *J. Bus. Ventur.* **2003**, *18*, 301–331. [CrossRef]
2. Shu, R.; Ren, S.; Zheng, Y. Building networks into discovery: The link between entrepreneur network capability and entrepreneurial opportunity discovery. *J. Bus. Res.* **2018**, *85*, 197–208. [CrossRef]
3. Zane, L.J.; DeCarolis, D.M. Social networks and the acquisition of resources by technology-based new ventures. *J. Small Bus. Entrep.* **2016**, *28*, 203–221. [CrossRef]
4. Guiñez-Cabrera, N.; Aqueveque, C. Entrepreneurial influencers and influential entrepreneurs: Two sides of the same coin, Business. *Int. J. Entrep. Behav. Res.* **2022**, *28*, 231–254. [CrossRef]
5. Zhang, J. The problems of using social networks in entrepreneurial resource acquisition. *Int. Small Bus. J.* **2010**, *28*, 338–361. [CrossRef]
6. Smith, C.; Smith, J.B.; Shaw, E. Embracing digital networks: Entrepreneurs' social capital online. *J. Bus. Ventur.* **2017**, *32*, 18–34. [CrossRef]
7. Lai, C.H.; Fu, J.S. Exploring the linkage between offline collaboration networks and online representational network diversity on social media. *Commun. Monogr.* **2021**, *88*, 88–110. [CrossRef]
8. Park, J.Y.; Sung, C.S.; Im, I. Does Social Media Use Influence Entrepreneurial Opportunity? A Review of its Moderating Role. *Sustainability* **2017**, *9*, 1593. [CrossRef]
9. Secundo, G.; del Vecchio, P.; Mele, G. Social media for entrepreneurship: Myth or reality? A structured literature review and a future research agenda. *Int. J. Entrep. Behav. Res.* **2020**, *27*, 149–177. [CrossRef]
10. Elia, G.; Margherita, A.; Passiante, G. Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technol. Forecast. Soc. Change* **2020**, *150*, 119791. [CrossRef]
11. Rippa, P.; Secundo, G. Digital academic entrepreneurship: The potential of digital technologies on academic entrepreneurship. *Technol. Forecast. Soc. Change* **2019**, *146*, 900–911. [CrossRef]
12. Eckhardt, J.T.; Shane, S. Opportunities and entrepreneurship. Journal of management. *J. Manag.* **2003**, *29*, 333–349.
13. Martinez, M.A.; Aldrich, H.E. Networking strategies for entrepreneurs: Balancing cohesion and diversity. *Int. J. Entrep. Behav. Res.* **2011**, *17*, 7–38. [CrossRef]

14. Shane, S.; Venkataraman, S. The Promise of Enterpreneurship as a Field of Research. *Acad. Manag. Rev.* **2000**, *25*, 217–226. [CrossRef]
15. Penrose, E. *The Theory of the Growth of the Firm*; Blackwell: Oxford, England, 2009.
16. Hoang, H.; Yi, A. Network-based Research in Entrepreneurship: A Decade in Review. *Found. Trends® Entrep.* **1968**, *11*, 1–54. [CrossRef]
17. Neergaard, H. Networking Activities in Technology-based Entrepreneurial Teams. *Int. Small Bus. J.* **2005**, *23*, 257–278. [CrossRef]
18. Greve, A.; Salaff, J.W. Social networks and Entrepreneurship. *Entrep. Theory Pract.* **2003**, *28*, 1–22. [CrossRef]
19. Newbert, S.L.; Tornikoski, E.T. Supporter networks and network growth: A contingency model of organizational emergence. *Small Bus. Econ.* **2012**, *39*, 141–159. [CrossRef]
20. Olanrewaju, A.S.T.; Hossain, M.A.; Whiteside, N.; Mercieca, P. Social media and entrepreneurship research: A literature review. *Int. J. Inf. Manag.* **2020**, *50*, 90–110. [CrossRef]
21. Granovetter, M. The strength of weak ties. *Am. J. Sociol.* **1973**, *78*, 1360–1380. [CrossRef]
22. Mariotti, F.; Delbridge, R. Overcoming Network Overload and Redundancy in Interorganizational Networks: The Roles of Potential and Latent Ties. *Organ. Sci.* **2012**, *23*, 511–528. [CrossRef]
23. Vissa, B. Agency in Action: Entrepreneurs' Networking Style and Initiation of Economic Exchange. *Organ. Sci.* **2012**, *23*, 492–510. [CrossRef]
24. Levin, D.Z.; Walter, J.; Murnighan, J.K. Dormant ties: The value of reconnecting. *Organ. Sci.* **2011**, *22*, 923–939. [CrossRef]
25. Boyd, D.M. Social Network Sites as Networked Publics: Affordances, Dynamics, and Implications. 2010. Available online: https://www.taylorfrancis.com/chapters/edit/10.4324/9780203876527-8/social-network-sites-networked-publics-affordances-dynamics-implications-danah-boyd (accessed on 30 March 2022).
26. Srinivasan, A.; Venkatraman, N. Entrepreneurship in digital platforms: A network-centric view. *Strateg. Entrep. J.* **2018**, *12*, 54–71. [CrossRef]
27. Mack, E.A.; Marie-Pierre, L.; Redican, K. Entrepreneurs' use of internet and social media applications. *Telecomun. Policy* **2017**, *42*, 120–139. [CrossRef]
28. Olsson, A.K.; Bernhard, I. Keeping up the pace of digitalization in small businesses—Women entrepreneurs' knowledge and use of social media. *Int. J. Entrep. Behav. Res.* **2020**, *27*, 378–396. [CrossRef]
29. Ahmad, S.Z.; Bakar, A.R.A.; Ahmad, N. Social media adoption and its impact on firm performance: The case of the UAE. *Int. J. Entrep. Behav. Res.* **2019**, *25*, 84–111. [CrossRef]
30. Eggers, F.; Hatak, I.; Kraus, S.; Niemand, T. Technologies That Support Marketing and Market Development in SMEs-Evidence from Social Networks. *J. Small Bus. Manag.* **2017**, *55*, 270–302. [CrossRef]
31. Lu, W.; Hampton, K.N. Beyond the power of networks: Differentiating network structure from social media affordances for perceived social support. *New Media Soc.* **2017**, *19*, 861–879. [CrossRef]
32. Song, Y. From Offline Social Networks to Online Social Networks: Changes in Entrepreneurship. *Inform. Econ.* **2015**, *19*, 120–133. [CrossRef]
33. Quinton, S.; Wilson, D. Tensions and ties in social media networks: Towards a model of understanding business relationship development and business performance enhancement through the use of LinkedIn. *Ind. Mark. Manag.* **2016**, *54*, 15–24. [CrossRef]
34. Kietzmann, J.H.; Hermkens, K.; McCarthy, I.P.; Silvestre, B.S. Social media? Get serious! Understanding the functional building blocks of social media. *Bus. Horiz.* **2011**, *54*, 241–251. [CrossRef]
35. Kaplan, A.M.; Haenlein, M. Users of the world, unite! The challenges and opportunities of Social Media. *Bus. Horiz.* **2010**, *53*, 59–68. [CrossRef]
36. Kuhn, K.; Galloway, T.; Collins-Williams, M. Near, far, and online: Small business owners' advice-seeking from peers. *J. Small Bus. Enterp. Dev.* **2016**, *23*, 189–206. [CrossRef]
37. Autio, E.; Nambisan, S.; Thomas, L.D.; Wright, M. Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strateg. Entrep. J.* **2018**, *12*, 72–95. [CrossRef]
38. Nawi, N.C.; Mamun, A.A.; Nasir, N.A.M.; Muniady, R. Factors affecting the adoption of social media as a business platform: A study among student entrepreneurs in Malaysia. *Vision* **2019**, *23*, 1–11. [CrossRef]
39. Puriwat, W.; Tripopsakul, S. Explaining social Media adoption for a business purpose: An application of the UTAUT model. *Sustainability* **2021**, *13*, 2082. [CrossRef]
40. Bellaaj, M. Why and how do individual entrepreneurs use digital channels in an emerging market? Determinants of use and channel coordination. *Int. J. Emerg. Mark.* **2021**. ahead-of-print. [CrossRef]
41. Mandal, D.; McQueen, R.J. Extending media richness theory to explain social media adoption by microbusinesses. *Te Kura Kete Aronui* **2013**, *5*, 1–28.
42. Katz, E.; Blumler, J.G.; Gurevitch, M. Uses and gratifications research. *Public Opin. Q.* **1973**, *37*, 509–523. [CrossRef]
43. Kim, M.J.; Lee, C.K.; Contractor, N.S. Seniors' usage of mobile social network sites: Applying theories of innovation diffusion and uses and gratifications. *Comput. Hum. Behav.* **2019**, *90*, 60–73. [CrossRef]
44. Pelletier, M.J.; Krallman, A.; Adams, F.G.; Hancock, T. One size doesn't fit all: A uses and gratifications analysis of social media platforms. *J. Res. Interact. Mark.* **2020**, *14*, 269–284. [CrossRef]
45. Rogers, E.M.; Singhal, A.; Quinlan, M.M. Diffusion of innovations. In *An Integrated Approach to Communication Theory and Research*; Routledge: England, UK, 2014; pp. 432–448.

46. Venkatesh, V.; Morris, M.G.; Davis, G.B.; Davis, F.D. User acceptance of information technology: Toward a unified view. *MIS Q.* **2003**, *27*, 425–478. [CrossRef]
47. Chen, G.M. Tweet this: A uses and gratifications perspective on how active Twitter use gratifies a need to connect with others. *Comput. Hum. Behav.* **2011**, *27*, 755–762. [CrossRef]
48. Dunne, A.; Lawlor, M.-A.; Rowley, J. Young people's use of online social networking sites—A uses and gratifications perspective. *J. Res. Interact. Mark.* **2010**, *4*, 46–58. [CrossRef]
49. Eighmey, J.; McCord, L. Adding value in the information age: Uses and gratifications of sites on the World Wide Web. *J. Bus. Res.* **1998**, *41*, 187–194. [CrossRef]
50. Creswell, J.W. *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*, 4th ed.; SAGE Publications: Thousand Oaks, CA, USA, 2014.
51. Myers, M.D. *Qualitative Research in Business and Management*, 3rd ed.; SAGE Publications: Thousand Oaks, CA, USA, 2020.
52. Neergaard, H.; Ulhøi, J.P. *Handbook of Qualitative Research Methods in Entrepreneurship*; Edward Elgar Publishing: Cheltenham, UK, 2007.
53. Eisenhardt, K.M.; Graebner, M.E. Theory building from cases: Opportunities and challenges. *Acad. Manag. J.* **2007**, *50*, 25–32. [CrossRef]
54. Glaser, B.; Strauss, A. *The Discovery Grounded Theory: Strategies for Qualitative Inquiry*, 1st ed.; Routledge: London, UK, 1999.
55. Kallio, H.; Pietila, A.-M.; Johnson, M.; Kangasniemi, M. Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *J. Adv. Nurs.* **2016**, *72*, 2954–2964. [CrossRef]
56. Rabionet, S.E. How I learned to design and conduct semi-structured interviews: An ongoing and continuous journey. *Qual. Rep.* **2011**, *16*, 563–566.
57. Engel, Y.; Kaandorp, M.; Elfring, T. Toward a dynamic process model of entrepreneurial networking under uncertainty. *J. Bus. Ventur.* **2017**, *32*, 35–51. [CrossRef]
58. Sullivan, D.; Ford, C.M. How entrepreneurs use networks to address changing resource requirements during early venture development. *Entrep. Theory Pract.* **2014**, *38*, 551–574. [CrossRef]
59. Drummond, C.; McGrath, H.; O'Toole, T. The impact of social media on resource mobilisation in entrepreneurial firms. *Ind. Mark. Manag.* **2018**, *70*, 68–89. [CrossRef]
60. Reis, D.A.; Fleury, A.L.; Carvalho, M.M. Consolidating core entrepreneurial competences: Toward a meta-competence framework. *Int. J. Entrep. Behav. Res.* **2020**, *27*, 179–204. [CrossRef]
61. Fiss, P. Building better causal theories: A fuzzy set approach to typologies in organization research. *Acad. Manag. J.* **2011**, *54*, 393–420. [CrossRef]
62. Ketchen, D.J., Jr.; Thomas, J.B.; Snow, C.C. Organizational configurations and performance: A comparison of theoretical approaches. *Acad. Manag. J.* **1993**, *36*, 1278–1313. [CrossRef]
63. Tsikriktsis, N. A technology readiness-based taxonomy of customers: A replication and extension. *J. Serv. Res.* **2004**, *7*, 42–52. [CrossRef]
64. Shepherd, D.A.; Haynie, J.M. Venture failure, stigma, and impression management: A self-verification, self-determination view. *Strateg. Entrep. J.* **2011**, *5*, 178–197. [CrossRef]
65. Ucbasaran, D.; Shepherd, D.A.; Lockett, A.; Lyon, S.J. Life after business failure: The process and consequences of business failure for entrepreneurs. *J. Manag.* **2013**, *39*, 163–202. [CrossRef]