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The Role of Environmental Factors for the Success of Digital Start-ups

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THE ROLE OF ENVIRONMENTAL FACTORS FOR THE SUCCESS OF DIGITAL START-UPS

Research Paper

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Abstract

Digital start-ups are perceived as an engine for innovation and job promotor. While success factors for non-IT start-ups have already been extensively researched, this study sheds light on digital entrepreneurs, whose business model relies primarily on services based on digital technologies. Applying the Grounded Theory method, we identify relevant environmental success factors for digital entrepreneurs. The study's research contribution is threefold. First, we provide 16 relevant and less relevant environmental success factors, which enables a comparison with prior identified factors. We found out that several prior environmental success factors, such as accessibility to transportation or the availability of land and facilities are less relevant for a digital entrepreneur. Second, we derive and discuss hypotheses for the influence of these factors on digital start-up success. Third, we present a theoretical model that lays the foundation for explaining the environmental influence on digital entrepreneurship success.

Keywords: Digital start-up, Entrepreneurship, Success Factors, Environment, Grounded Theory

1 Introduction

Digital transformation is an important phenomenon in strategic Information Systems (IS) research (Vial 2019). The basis for digital transformation is the application of digital technologies, which comprise technologies related to social, mobile, analytics, cloud, and the internet of things (IoT) (Sebastian et al. 2020). Digital innovations applying these technologies are in the focus of current entrepreneurs (Oppong-Tawiah und Bassellier 2017). Despite the phenomenon of large IT-firms such as IBM, Apple, Microsoft, and Google which fundamentally changed how society and the economy work since the beginning of IT, in the last decade, young digital technology firms, such as Airbnb, Uber, and Spotify, are about to gain the same influence. Start-ups apply IT to create new and innovative products and services (Cho und McLean 2009). Moreover, start-ups contribute to the economic development, wealth ,and job creation (Sulayman et al. 2014; Kelley und Nakosteen 2005). But while some start-ups have become successful very quickly, many more start-ups have gone out of business and were deceased (Spiegel et al. 2016). According to Hyder und Lussier (2016), less than 20 % survive the first year of existence. Software start-ups even fail in the first year with a probability of 80 - 95 % (Patel 2015).

Start-up success factors can be distinguished into organizational, individual, and environmental factors (Santisteban und Mauricio 2017; Gartner 1985). Individual factors comprise the entrepreneurs' own capabilities, such as management experience and entrepreneurial education (Olsen et al. 2018) and organizational factors comprise start-up characteristics. Environmental factors represent the characteristics of the environment, such as government support, venture capital, or intensity of

competition (Santisteban und Mauricio 2017). In addition, Santisteban und Mauricio (2017) pointed out that the external environment can serve as the driving force behind the performance and growth of IT-start-ups, which motivates the scope of the study at hand.

The Silicon Valley, where the most famous entrepreneurial start-up ecosystem worldwide is located, proves the value of the environmental dimension by bringing up successful start-ups repeatedly. Against this background, Du et al. (2018) describe the emergence of a meta-organization in Zhongguancun, which is considered to be the Chinese Silicon Valley. Zhongguancun transformed from a marketplace of electronics to a digital entrepreneurial ecosystem. A meta-organization is a collection of legally independent organizations and individuals, who are not linked via any employment relationships (Gulati et al. 2012). The entrepreneurial ecosystem in Zhongguancun is perceived as a meta-organization, because entrepreneurs, investors, incubation centers, and universities build a coordinated network without any employment relationships (Du et al. 2018). Spigel (2017) takes an ecosystem perspective on the environmental dimension to conceptualize the attributes of such entrepreneurial ecosystems.

Various studies regarding the external environment of a digital start-up exist (Santos et al. 2011; Eesley und Wu 2019; Millán et al. 2014; Antretter et al. 2018; Kasabov 2015). They have in common that they focus on dedicated factors, such as the role of mentorship (Eesley und Wu 2019) or digital traces to predict startup success (Antretter et al. 2018), which is typical for quantitative studies, whose nature is descriptive, comparative, or associative (Onwuegbuzie und Leech 2006). Even the relational organization of entrepreneurial ecosystems (Spigel 2017) does not focus on the specific nature of digital entrepreneurship. Furthermore, we noticed a lack of qualitative research studies, whose questions are more "open-ended, evolving, and non-directional" (Onwuegbuzie und Leech 2006, p. 482) as well as the missing of a theoretical model that covers the entire environmental dimension of digital entrepreneurship.

By this study, we aim at theory elaboration (Fisher und Aguinis 2017) to make theoretical advancements in the domain of environmental success factors for digital entrepreneurship. Therefore, we answer the research question: *Which environmental factors influence the success of digital start-ups and how do they differ from other start-ups?* We follow the call for more qualitative IS research (Hirschheim und Klein 2012) and address this research question by applying the Grounded Theory method (GTM) (Urquhart et al. 2010; Strauss und Corbin 1998). The study's research contribution is threefold. First, we present a list of relevant and less relevant environmental factors for the success of digital start-ups. The results enable a comparison with prior investigations of "traditional" start-ups, i.e. start-ups whose business model does not rely on digital technologies. Second, we derive hypotheses for the influence of these factors on the success of digital start-ups. Third, we present and discuss a theoretical model that explains the environmental influence on digital entrepreneurship.

The paper is structured as follows. First, Chapter 2 sets the foundation for this study by sharpening the concept of digital entrepreneurship, highlighting the importance of the entrepreneurial ecosystem, and outlining the status quo of start-up success research. In the following Chapter 3, the research design is presented. Chapter 4 then discusses the results and derives hypotheses regarding the social, material, and cultural dimensions. Based on this, a theoretical model for the success of digital start-ups is developed in Chapter 5. The study ends with a conclusion and an outlook in Chapter 6.

2 Foundations

2.1 Digital entrepreneurship

The earliest researchers explain the term entrepreneurship as a realization of new factor combinations, like new products, new services, new resources, new production methods, new markets, or new kinds of organizations (Schumpeter und Redvers 1934). Organizations, which enter the market as "creative destroyers" of ancient structures, are so-called start-ups (Christensen 2013). Furthermore, a start-up is a temporary form of an organization, which ends when it has found a repeatable and scalable business model and market fit (Blank und Dorf 2020; Santisteban und Mauricio 2017). Unlike typical

organizations, start-ups operate in a unique, uncertain contextual environment, which makes it hard for them to survive (Blank 2013; Ries 2011). Next to the limited experience, start-ups often struggle as they are facing a lack of resources, they are sensitive to external influences, and they are often caught by dynamic technological changes (Sutton 2000).

Spiegel et al. (2016) elaborate on the link between IT and entrepreneurship, which is immanent in the context of internet start-ups and leverages internet technologies to create digital products that gain competitive advantages. For the study at hand, it is important to distinguish clearly between a traditional start-up and a start-up, whose business model is based on digital technologies. The nature of digital technologies can be described by the SMACIT acronym (Sebastian et al. 2020), which comprises technologies related to social, mobile, analytics, cloud, internet of things (IoT). Vial (2019) further extends it by platforms & ecosystems. According to Giones und Brem (2017), digital entrepreneurs focus on new services that are based on the Internet, running in the cloud, and using big data or artificial intelligence. For the work at hand, we follow Steininger (2019), who defines digital start-ups as "new ventures that use IT in the role of a ubiquity, meaning that they leverage completely IT-driven and digital business models for their value creation and capture".

The comprehensive literature review of Santisteban und Mauricio (2017) reveals several definitions for start-up success. According to Spiegel et al. (2016) "exploiting the underlying opportunities" determines the success or failure of a start-up company. We follow that definition for the study at hand and perceive the success of digital entrepreneurs as the ability to exploit the opportunities of the underlying digital technology-based business model. Success factors are dependent on the kind of business the new venture operates. This becomes clear when comparing the environmental success factors defined for traditional start-ups by Gartner (1985) (22 factors) with the environmental factors for IT start-ups, found in the literature review of Santisteban und Mauricio (2017) (5 factors). These differences further extend the need for investigating relevant environmental success factors of digital start-ups.
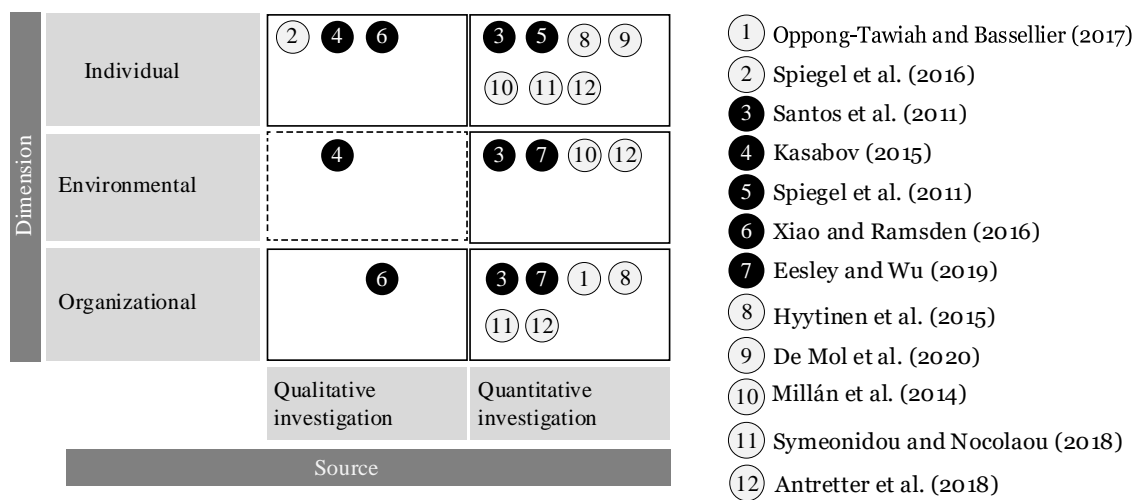
2.2 New venture creation and entrepreneurial ecosystems

The process of starting a business is not a routine, which is executed repeatedly by entrepreneurs and cannot be followed by like a recipe (Hartman 1983). Rather, new venture creation is a complex phenomenon because these new organizations operate and respond to diverse environments, and the actions they do or do not vary widely. Gartner (1985) suggests a framework for new venture creation, which is the foundation for many studies in IS research (e.g., Antretter et al. 2018; Lehmann und Rosenkranz 2017). Influential variables for new ventures are categorized into four dimensions (Individual, Organization, Process, and Environment) (Gartner 1985).

The study at hand focuses on the environmental dimension, which covers variables concerning the situation surrounding and influencing the organization (Gartner 1985). Gartner (1985) observes that entrepreneurs do not operate in vacuums, they rather respond to their environment. The existence of highly supportive environments, like start-up hotspots, incubators and accelerators can "create" entrepreneurs (Pe'er und Keil 2013). The idea of an environment that either "pushes" (as a lack of alternatives) or "pulls" (as an attractive chance) individuals to create a new venture is common in entrepreneurship research (van Gelderen et al. 2005). Furthermore, the environment is particularly crucial for the start-up's performance and growth (Santisteban und Mauricio 2017). Against this background, Spigel (2017) developed a framework for the relational organization of entrepreneurial ecosystems and elaborate on the following attributes that characterize it: supportive culture, histories of entrepreneurship (cultural attributes); worker talent, investment capital, networks, mentors, and role models (social attributes), policy and governance, universities, support services, physical infrastructure, open markets (material attributes). These attributes can be grouped into three categories: social, material, and culture (Spigel 2017). *Social* attributes comprise "the resources composed of or acquired through the social networks within a region" (Spigel 2017). Material category describes "the tangible presence in the region", such as universities or entrepreneurial policies (Spigel 2017).The category *culture* comprises all attributes that describe the "underlying beliefs and outlooks about entrepreneurship within a region" (Spigel 2017).

2.3 Status quo in start-up success research

Several research works investigated the success factors for start-ups in the past (Santisteban und Mauricio 2017). We searched for previous research and analyzed them regarding its research methodology, its focus on IT start-ups, and the addressed success factor dimensions (Gartner 1985). The results are provided in Figure 1, whereas the dotted area marks the current research focus. The papers, which are illustrated in a grey circle, focus on generic start-ups, i.e. they do not explicitly investigate IT start-ups. In total, we could identify seven papers without an explicit focus on IT start-ups (Oppong-Tawiah und Bassellier 2017; Spiegel et al. 2016; Hyytinen et al. 2015; Mol et al. 2020; Millán et al. 2014; Symeonidou und Nicolaou 2018; Antretter et al. 2018), out of which Millán et al. (2014) and Antretter et al. (2018) quantitatively investigate environmental success factors. Five papers investigate success factors with a strong focus on IT start-ups (Santos et al. 2011; Kasabov 2015; Spiegel et al. 2011; Xiao und Ramsden 2016; Eesley und Wu 2019). Out of these five papers, Santos et al. (2011) as well as Eesley und Wu (2019) quantitatively research environmental success factors of IT start-ups. Solely Kasabov (2015) investigates environmental success factors of IT start-ups qualitatively. Its focus rather lays on investigating difficulties of IT start-ups in an emerging country, for which Kasabov (2015) investigate IT clusters in Vietnam. The study reveals resource inadequacies and a missing compensation through private investors as well as a passivity of entrepreneurs and a lack of confidence in the government support. However, Kasabov (2015) does not explicitly focus on retrieving success factors for IT start-ups.

Figure 1.   Literature for (IT) Start-up Success Factors

So far, to our best knowledge, no research work provides a theoretical model to explain the effect of environmental factors on the success of digital entrepreneurship. We fill that research gap by applying a qualitative research design, based on the GTM (Urquhart et al. 2010; Urquhart und Fernández 2016; Strauss und Corbin 1998), which we describe in the following section.

3   Research Design

3.1   Research process and planning

The research at hand is abductive in nature and follows the GTM. Although the GTM was developed in the field of sociology during the 1960s (Glaser und Strauss 1967), it is also considered good practice for theory origination in the fields of both information systems (Urquhart und Fernández 2016) and entrepreneurship (Mäkelä und Turcan 2007). The GTM aims "to discover what is going on, rather than assuming what should go on" (Glaser 1978). When starting with an existing theory, the aim of the GTM

is "to enhance the theory, widen its scope or in other ways improve it – but not to verify or falsify it" (Urquhart et al. 2010). We apply the GTM to refine the theoretical considerations about the relational organization of entrepreneurial ecosystems (Spigel 2017) and to identify relevant success factors for a digital start-up. We follow the recommendations of Strauss und Corbin (1998) and conduct a three-stage process, containing an open, axial, and selective coding. The whole research process, the main activities, and some coding examples are illustrated in Figure 2.

The work at hand aims at investigating environmental factors that influence the success of a digital start-up and how they differ from other start-ups. Based on those factors, we develop a theoretical model that explains the influence of environmental factors on digital start-up success. Therefore, we identified experts, who are either founders or co-founders of a digital start-up. To collect the data for the analysis, we conducted semi-structured and open-ended interviews. Seven key questions, following the guidelines for doing semi-structured interviews (Kvale 2011), were prepared. In order to evaluate the understandability of the questions, we discussed them with two test persons and precised the questions afterwards. Table 1 provides the final interview guideline.
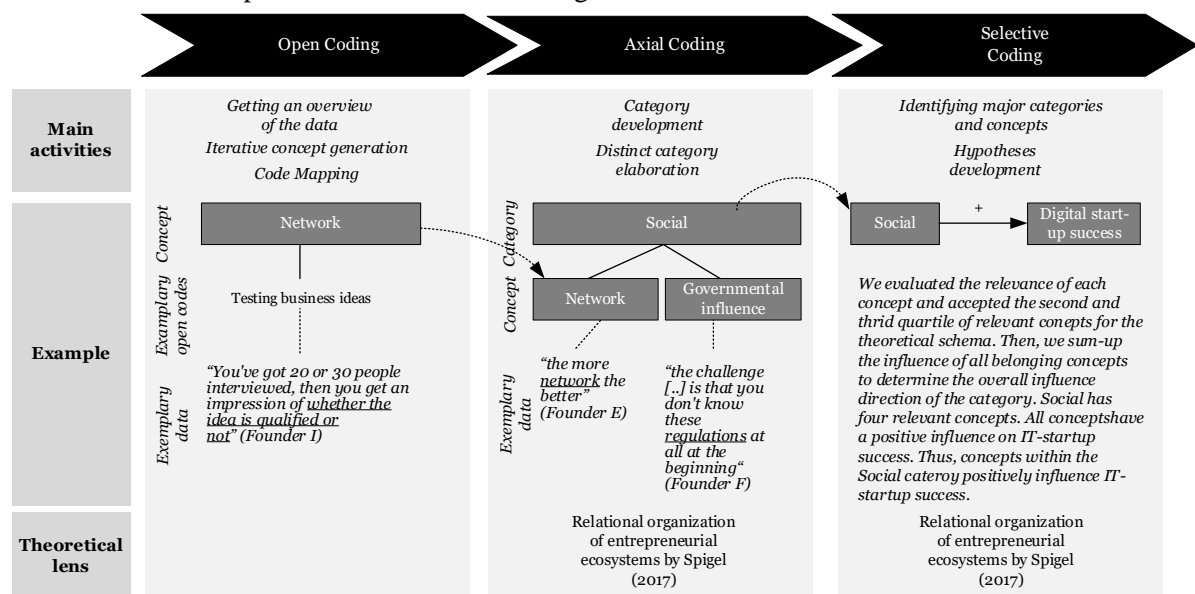

Figure 2.   Research process

No.	Question
1	Would you like to outline your business idea and tell which challenges you are currently facing?
2	What does success mean to you, and when do you call a start-up a success?
3	Which environmental criteria significantly influence the success of your start-up?
4	Which environmental criteria pose a risk to the success of your start-up?
5	What do you think is the difference between regular start-ups and IT start-ups regarding the environmental success criteria?
6	What advice do you want to give to future entrepreneurs regarding their environment?
7	Is there anything you would like to add regarding this topic?

Table 1.   Final interview guideline

3.2   Conducting the interviews and preparing the analysis

Start-ups generally may vary widely in many different dimensions, such as the number of founders, the founding time, and whether they still exist. To find suitable interview partners, we applied a purposeful sampling strategy because for answering the research question it is essential to get informed interviewees rather than a representative sample of all founders. To ensure that the interviewees are informed and are able to answer the questions, we set up two criteria. First, the interviewee must have at least founded

one digital start-up, either in the domain of software development, platform business, B2B or B2C. Second, the start-up must be founded at least one year before the interview takes place to ensure that substantial experience in terms of digital entrepreneur success factors is present. We considered these criteria in the selection of the interview partners and found ten digital start-up founders. All interviewees work for a German digital start-up either as the CEO or in some other kind of a senior position. They accompany the start-up from day one since the founding date. Table 2 provides the interviewee's demographics.

The transcriptions were made with the software f4transkript. The oral conversations and written texts are content related quite similar, though we decided to omit to transcribe every break and every hesitant sound when they are not important for the analysis of the statement. All relevant statements made by the interviewees were categorized into codes, for which we apply the software f4analyse. For developing a suitable and meaningful coding schema, we iterate several times through the transcribed data, whereas an equivocal statement can be assigned to multiple codes when it addresses more than one topic. In each iteration, codes can be added, renamed, or removed.

Name	Gender	Age	Education	Start-up founded in	Number of founders	Type of business	Number of employees	Interview duration
Founder A	Female	29	MD	2016	1	Platform, B2C	1	00:42:35
				2019	2	SD, B2B	4	
Founder B	Male	29	MD	2018	3	SD, B2B	Deceased	00:48:40
				2019	2	Platform, B2B	0	
Founder C	Male	27	SecS	2018	2	SD, B2B	Deceased	00:14:17
				2019	2	SD, B2B	2	
Founder D	Male	29	SecS	2017	5	Platform, B2B2C	Deceased	00:24:07
				2018	5	Platform, B2B2C	Deceased	
Founder E	Male	24	SecS	2018	2	Platform, B2B2C	Deceased	00:31:24
				2019	4	Platform, B2B2C	0	
Founder F	Male	28	BD	2018	2	IoT, B2C	16	00:14:07
Founder G	Male	36	MD	2017	2	Platform, B2B/B2C	6	00:26:13
Founder H	Female	31	MD	2019	2	SD, B2C	2	00:21:38
Founder I	Female	25	MD	2019	2	Platform, B2C	0	00:25:16
Founder J	Male	40	Diploma	2013	1	SD, B2B and B2C	4	00:31:43
MD: master's degree; BD: Bachelor's Degree; SecS: Secondary School; SD: software development								

Table 2.   Interviewee demographics

3.3   Analysis and theory development

The three steps of open, axial, and selective coding are intertwined (Strauss und Corbin 1998) and thus we conduct them iteratively. The goal of the first stage (*open coding*) is to identify valid concepts (i.e., characteristics of a category) that drive the success of a digital start-up. After identifying the concepts, such as *network* or *financial support*, we are interested in their relevance. Therefore, we apply three measures, suggested by Vogelsang et al. (2013): *Relevance*, *Code Frequency* and, *Interview frequency*. First, we deduce the scale of the relevance for each concept. For this purpose, Vogelsang et al. (2013) suggest distinguishing four different values: *Explicit rejection* (-1), *No reference* (0), *Reference* (1), and *Reference with an accent* (2). We evaluate all codes by these four relevance values. In this way, a concept may for example receive a total relevance score of three, even though a total number of ten codes are assigned to it.

The total number of codes addressing one specific concept, summed up for all interview partners, is called *Code Frequency* and the *Interview Frequency* is the number of interviewees, who made at least one statement related to a concept (Vogelsang et al. 2013). We continue with the *axial coding*, in which we develop categories and assign the identified concepts uniquely to one category. Again, we work iteratively. In total, 222 codes match to 16 different concepts, divided into three categories. While assigning the codes to the concepts, we look for patterns in the data, like similarities and overlaps, intending to file the codes into clusters. Inspired by the relational organization of entrepreneurial

ecosystems (Spigel 2017), we distribute all codes to three categories, which are *social, material, cultural*. The final analysis step comprises *selective coding*, in which we select relevant concepts and categories based on the former calculated relevance score, in order to create a larger theoretical schema (Strauss und Corbin 1998). Therefore, we select solely concepts, whose relevance score exceeds the first quartile, which is ~ 6.5 for the study at hand. Based on the relevant concepts, we develop hypotheses and compare them with common literature findings.

4 Analysis Results

The results are ordered regarding the relevance value of the concepts. In addition, we provide the corresponding entrepreneurial ecosystem attribute, as introduced by Spigel (2017),and a tendency for the influential direction of a concept. The Median of all relevance scores is 19. Overall the most relevant factor is the founder`s *Network*, which receives a relevance score of 38. The most irrelevant factor for the success of a digital start-up is *Accessibility of transportation*, which receives a total relevance score of two. We found two success factors (concepts), which are new compared to the framework relational organization of entrepreneurial ecosystems (Spigel 2017). Within the material concepts, the factors *competitive environment* and *living conditions* evolved. All other concepts are comparable to factors within the framework for relational organization of entrepreneurial ecosystems (Spigel 2017) and seem to be applicable for digital start-ups as well. Table 3 provides an overview of all 16 environmental success factors for digital start-ups, which we derived from the coded interviews. In the following, we present the results with a focus on more relevant concepts and derive meaningful hypotheses.

Categories and Concepts	equivalent entrepreneurial ecosystem attribute	Relevance	Code Frequency	Interview frequency	Tendency
Social		**113**	**85**	**31**	
Network	Network	38	27	9	+
Technically skilled labor force	Worker talent	26	24	7	+
Venture capital availability	Investment capital	26	19	8	+
Presence of experienced entrepreneurs	Mentors and role models	23	15	7	+
Material		**134**	**115**	**51**	
Governmental legislation	Policy and governance	30	25	6	-
Availability of supporting services	Support services	26	21	9	+
Competitive environment	n/a	21	15	7	-
Accessibility of customers or new markets	Open Markets	19	13	8	+
Financial support	Policy and governance	15	9	4	+
Proximity of universities	Universities	8	15	5	+
Availability of land or facilities	Physical infrastructure	6	9	5	+
Living conditions	n/a	4	4	4	+
Accessibility of suppliers	Physical infrastructure	3	3	2	+
Accessibility of transportation	Physical infrastructure	2	1	1	+
Cultural		**33**	**22**	**9**	
Attitude of the area population	Supportive Culture	19	12	5	+
Local customer awareness	Supportive Culture	14	10	4	+
Total		**280**	**222**	**91**	

Table 3.   Environmental success factors of digital start-ups

4.1 Social dimension

Network's relevance (38) is ranked highest not only in the category social but also from all 16 factors. The same is true for its frequency ranking (27) and its interview frequency ranking (9). The latter it shares with the factor *Availability of supporting services*. The founders' network consists of personal contacts, like family, friends, and acquaintances, as well as professional contacts, such as colleagues and business partners. The network's importance was emphasized many times either as an opportunity

to boost sales or to get inspired by new people and their ideas. Its core value for digital start-ups and their founders though is to help and support each other, which happens mostly between start-up founders. One interview partner emphasizes the importance of a network by saying "if I don't have one at all, then I would worry if I'm the right guy for the role" (Founder F). Generally, most interview partners agreed to the term "the more network the better" (Founder E). Often, they connect at co-working spaces, incubators, or conferences. One interview partner said: "you can create such good synergies with start-ups where you might think at the beginning, ok, they actually do something completely different than we do, but at the same time you can still help each other" (Founder J). Founder I uses his network for testing new business ideas and hypotheses in the following way: "You've got 20 or 30 people interviewed, then you get an impression of whether the idea is qualified or not. Whether it is worth pursuing. And that is definitely a success factor, and that's how I use it" (Founder I). Consequently, we set up the first hypothesis (H1): An environment that enables networking drives the success of a digital start-up.

Technically skilled labor force is ranked second by its relevance (26), sharing the position with the factors *Availability of supporting services* (category *Support*), and *Venture capital availability* (category material). Collectively, 24 statements about this topic were made in seven interviews. The biggest challenge for a digital start-up is the availability of software developers, as highlighted by many interviewees. A digital start-up needs a proactive plan to attract talents, because many of them prefer working in large corporations, and they are not willing to relocate their homes, due to the lack of income security, the start-up has to offer. What makes it even more complex is that the war for talents is "one of the activities that you cannot delegate at the beginning as managing director and founder" (Founder F). Possible solutions next to locating the start-up, where developers are available, are either to enable remote working or to outsource these activities. Not only is the recruiting of developers crucial for success, but also the retaining. Founders need to "bind the people behind their vision. They have to give people a higher purpose in their work than others" (Founder D). Thus, an environment that provides technically skilled employees positively affects the success of a digital start-up (H2).

The third most important factor out of all, along *Technically skilled labor force* (category Location) and *Availability of supporting services* (category Support)*,* is the *Venture capital availability*. Raising venture capital is widely recognized as a sign for future success. Founder D perceives the role of venture capital as follows: "it's just a milestone that many people need, and when they reach that milestone, it's already an important point, an important sign". With raising venture capital, the IT sector is well served, compared to other sectors, as mentioned by Founder A: "Financing makes a big difference; there are simply industries where investments are extremely high. I know the IT industry very well, so there is a lot of investment". Founder F refers to globally available venture capital and says "capital is now as flexible as IT. In other words, it does not have to be on-site" (Founder F). These findings are reflected in hypothesis H3: The availability of venture capital is obligatory for the success of a digital start-up.

The *Presence of experienced entrepreneurs* is ranked fourth in the dimension social. The interviewed founders report about benefits from the presence of experienced entrepreneurs by getting feedback, receiving help and support, or exchanging information. To achieve this kind of exchange between entrepreneurs, digital start-up founders use co-working spaces, as well as incubators and entrepreneurship associations. Founder F reports that through an experienced entrepreneur "you get an external perspective on the internal factors. […] Someone who looks at it and says: How do you fit together? What are you missing? What do you have"? Thus, we hypothesize that the more experienced entrepreneurs exist in the closer environment of the digital start-up the more successful it will be (H4).

4.2   Material dimension

Governmental legislation is the most important concept within the category *Material*. With an interview frequency of six, it is only ranked upper mean, which stresses its special importance for some founders, while for other founders' Governmental legislation, such as regulations, are not that important. Even with such a high relevance score, we found out that solely for some digital start-up founders regulation and laws are a crucial success factor. Founder F said: "It's really unbelievable how many regulations

there are that actually apply to us". He adds: "The challenge for the founder at this point is that you don't know these regulations at all at the beginning. And there's not one list where they're just obtuse to each other, nobody's ever written that before". Founder I confirms this by saying: "You have to look, of course, depending on what you do, what laws do I fall into? What do I have to observe? If you don't do that, it can be very expensive. […] Well, laws are a big issue for me". We hypothesize that the more regulation a digital start-up is confronted with, the less successful it will be (H5).

Availability of supporting services shares its relevance ranking position with *Technically skilled labor force* and *Venture capital availability (both* category *Social).* From all factors, it has the fourth-highest code frequency (21) and is next to *Network* the only factor that reaches an interview frequency of nine. The interview partners emphasize the importance of external helpers. Founder A suggests to "[…] look for a mentor, who is [expert] in the field and perhaps takes a bit more the customer [perspective]". Occasionally mentors and consultants with start-up experience as well as supervisors are named as possible supporters. Highly relevant and often highlighted though was the positive influence of co-working spaces with special assistance, where many different kinds of advisors and institutions connect and support each other. This leads to the sixth hypothesis: An environment that offers supporting services positively influences Digital entrepreneur success (H6).

Competitive environment is ranked third within the category *Material*. Competition is perceived as a risk to the success of a digital start-up because particularly big players use their market power to suppress competition. Founder A describes it as follows: "I thought that I could reach a niche that the big players wouldn't take away from me. But it turned out that it was just super, super difficult to get any kind of exposure online because the big players [take] all the keywords [and do] all the search engine optimization". Founder E outlines, "if Google had said, okay, we'll just use the new formats on our platform, integrate them into our existing system, we would be left out". Founder F sums it up: "Well, there was just a lot of pressure to keep us out of the market". Anyway, for innovative products, competition can also be a positive factor, because "this shows a certain acceptance especially for the product, and a certain demand" (Founder H). Thus, we hypothesize that the existence of large direct competitors leads to an unfair competition and thus hinders the success of a digital start-up (H7).

The second factor in this category, *Accessibility of customers or new markets,* comprises the sales perspective, which is perceived as challenging. Founder D said, "the challenges were the sales, […] many IT founders underestimate, that the product has to be sold". Founder J perceives customer acquisition as "the biggest challenge". According to Founder I, a success factor then is the ability to "move where your audience is" or to "see where the hotspots are on customers" (Founder E). Thus, an environment that enables access to customers and new markets boosts Digital entrepreneur success (H8).

The next concept within the Material category comprises the availability of *Financial support*, which receives a relevance score of 15. The concept comprises direct financial support of founders granted by the government, for instance, the availability of a scholarship. "A scholarship allows me to put 100% of my time into the start-up, yes, and that is definitely a huge factor" (Founder B). These scholarships commonly run for one year and cover living expenses. Despite the importance of financial support, Founder G mentions: "there may come more, there must come more" and Founder J adds: "it could be a little better here, but of course, you have to be grateful for things like the start-up scholarship". Thus, we hypothesize that an environment that offers financial support for a founder enables a digital start-up to focus on value creation (H9).

With a high frequency of 15 statements, but a rather small relevance of eight, the interviewees controversially discuss the *Proximity of universities*. It is important to differentiate between start-ups that are founded within the university and start-ups that are founded with the help of universities. The former can lead to conflicts of interest on how to spin-off start-ups from the university. Additionally, universities do not focus on development speed and pivots, which makes it hard to achieve the necessary market fit. The latter though is perceived positively. Founders appreciated universities as valuable references as well as the technical and personal support they receive. Financial support, for example by giving away software licenses for free, is mentioned positively as well. The primary benefit for digital start-ups though is that "we have a lot of really good universities here, where you can also find top

educated people" (Founder G). Consequently, we propose H10: The proximity to universities increases the recruiting opportunities of a digital start-up.

4.3 Cultural dimension

The *Attitude of the area population* describes the thoughts and basic opinions of digital start-up stakeholders in the closer environment of the new venture. For Founder D the "willingness of companies to cooperate" is very important. Employees at established companies seldom go beyond proven practices and procedures, which makes it hard for digital start-ups to sell their innovative product or service to them. It is a cultural challenge. A second aspect is the visibility of the digital start-up's value and economic contributions in order to become recognized as attractive employer for young talents. These findings bring us to the next hypothesis (H11): An innovation friendly and open culture of people around the digital start-up drives its success.

Within the dimension culture, the *Local customer awareness* is ranked second with a relevance score of 14. For a digital start-up, it is important to become visible in the market, which begins with the branding process and public relations. One interview partner emphasized the relevance of starting locally, by saying: "Even if you think, your customers are actually all over Germany or all over Europe or even internationally, you wouldn't believe how valuable it is to become known in the region first" (Founder A). A local focus simplifies to attract attention from the local press. Founder J also addresses this factor and aims at describing complex IT products and services "humanly", so that everybody understands, what the value of their technological invention is. This leads to H12: A local customer awareness and publicity drive the digital entrepreneur success.

5 Theoretical Model for the Success of Digital Start-ups

To develop a theoretical model for the effect of environmental success factors on the success of a digital start-up, we built on the three previously identified categories for Digital entrepreneur success: *Social, Material,* and *Cultural,* and specify the categories by assigning the most relevant success concepts to it. Therefore, we exclude all factors, which have a relevance score below the first quartile (< 6.5). The complete model and the corresponding hypotheses are depicted in Figure 3.
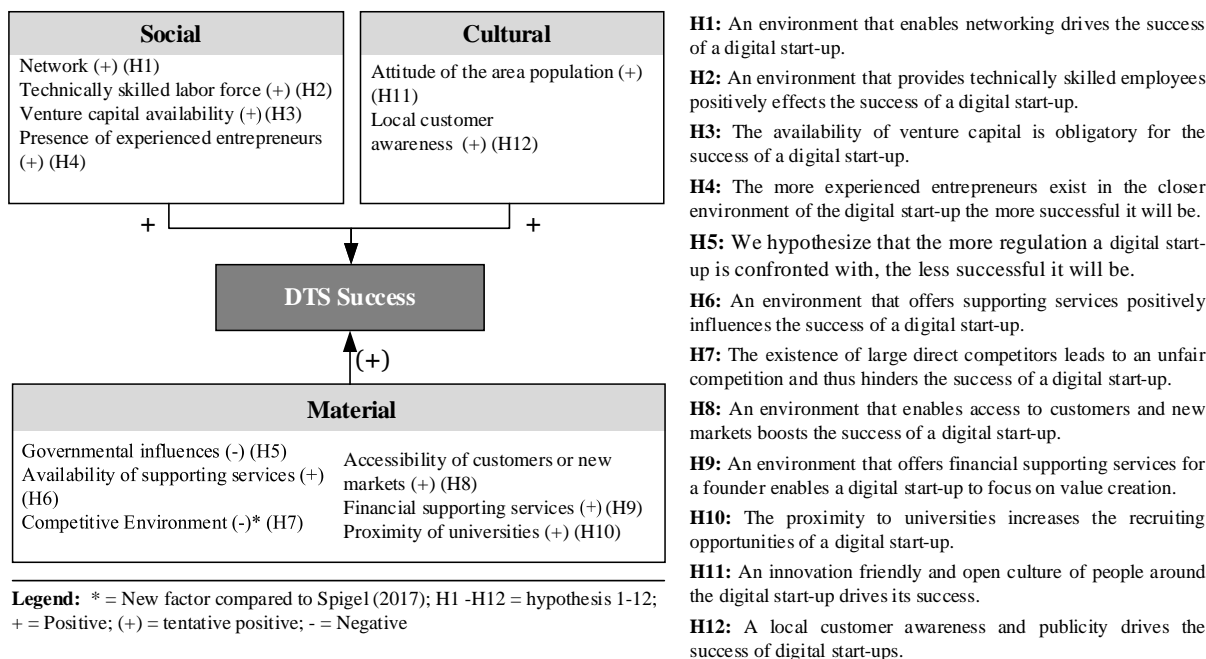

Legend: * = New factor compared to Spigel (2017); H1 -H12 = hypothesis 1-12; + = Positive; (+) = tentative positive; - = Negative

H1: An environment that enables networking drives the success of a digital start-up.

H2: An environment that provides technically skilled employees positively effects the success of a digital start-up.

H3: The availability of venture capital is obligatory for the success of a digital start-up.

H4: The more experienced entrepreneurs exist in the closer environment of the digital start-up the more successful it will be.

H5: We hypothesize that the more regulation a digital start-up is confronted with, the less successful it will be.

H6: An environment that offers supporting services positively influences the success of a digital start-up.

H7: The existence of large direct competitors leads to an unfair competition and thus hinders the success of a digital start-up.

H8: An environment that enables access to customers and new markets boosts the success of a digital start-up.

H9: An environment that offers financial supporting services for a founder enables a digital start-up to focus on value creation.

H10: The proximity to universities increases the recruiting opportunities of a digital start-up.

H11: An innovation friendly and open culture of people around the digital start-up drives its success.

H12: A local customer awareness and publicity drives the success of digital start-ups.

Figure 3.   Theoretical model for environmental success factors of digital start-ups

Santisteban und Mauricio (2017) found in total five external factors that influence the success of an IT start-up positively (+) and negatively (-): government support (+), venture capital (+), level of

competence (+), dynamism of the environment (-), and science and technology policy (+). Compared to the results of the study at hand, we can confirm the relevance of government support, venture capital, the competitive environment, and governmental legislation. The factor *dynamism of the environment* could not be identified as a relevant factor in this study. In turn, we found seven additional factors compared with the study of Santisteban und Mauricio (2017) (*availability of supporting services*; *technically skilled labor force*; *presence of experienced entrepreneurs*; *attitude of the area population*; *proximity of universities*; *accessibility of customers / new markets*, and *customer awareness/publicity*).

Regarding the attributes of entrepreneurial ecosystems (Spigel 2017), we can confirm the relevance of a supportive culture, worker talent, investment capital, networks, mentors and role models, policy and governance, universities, support services, and open markets. According to our findings, the existence of physical infrastructure seems to be less relevant for digital start-up founders. The role of competitive environment and living conditions are not mentioned by Spigel (2017) and are potential candidates to extend the attributes of entrepreneurial ecosystems, whereas the latter seems to be less relevant for Digital entrepreneur success. In the following, we discuss our results and the corresponding hypotheses by comparing them with relevant findings of prior literature.

5.1   Social

The digital start-up founder`s *network* is the most relevant success factor and confirms the findings of Perotti und Yu (2015). The importance of a network for founders of a digital start-up becomes clear when having a look at the different usage scenarios of the personal network. For instance, network members provide the ability to boost sales. The more contacts the founder has the more sales opportunities he receives. Another network usage is to get inspired by new and innovative people and their ideas. Based on those inspirations, the founder may integrate new ideas into his own product. However, the core value of a network in the digital start-up scene is mutual support and help (Spiegel et al. 2016; Hormiga et al. 2011).

According to Solymossy (2000), human capital is more important for the success of a new venture than the initial organizational setting. The technical knowledge to gain competitive advantage was proven as a relevant factor for start-ups (García-Muiña und Navas-López 2007; Groenewegen und Langen 2012; Li et al. 2010). Particularly for digital start-ups, a *technically skilled labor force* is important, since they compete for software engineers and developers with other companies in the closer region as well as globally. A proper financing is essential for the success of start-ups (Song et al. 2008; Azimzadeh et al. 2013). In line with these findings, the interview results indicate that *venture capital availability* is also important for a digital start-up, which end-up in H3.

The *presence of experienced entrepreneurs* is essential for the success of a digital start-up, which confirms prior study results, in which a supportive culture around the start-up positively affects the start-up motivation and venture emergence (Hopp und Stephan 2012). Strong ties with other entrepreneurs boost the information exchange in the whole start-up community. Moreover, start-up investors usually were successful entrepreneurs themselves (Bruno and Tyebjee 1982).

5.2   Material

"The legal environment in which small businesses operate is becoming more complex, and entrepreneurs must understand the basics of business law if they are to avoid legal entanglements" (Scarborough und Zimmerer 2003). Our model reflects this finding by the concept of *Governmental legislation*, which is ranked second highest by its relevance from the analysis of the expert interviews of this study. Contrariwise, Sebora et al. (2009) report that the regulatory influence is not statistically significant for IT start-up success. However, based on our findings, we argue that many complex regulations lead to additional effort for understanding and for being compliant. The time spent for being compliant with regulations is time that the founder cannot invest in the start-up and its product (Martin und Matt 2018).

The interview results confirm the importance of *supporting services*, such as mentoring, during the founding-phase of a digital start-up. While the positive effects of mentoring in an organizational setting are common knowledge (Viator und Scandura 1991; Saxenian 2002; Krueger et al. 2000), Mejia und

Gopal (2018) could additionally show that software start-ups, which receive mentorship, are more likely to achieve short-term outcomes, such as a minimum viable product and a first sale. A *competitive environment* is fundamental for the success of start-ups (Pugliese et al. 2016). However, big players, such as Amazon and Google, dominate the market (Simon 2018) and to some extent, they make the rules of the market (e.g. Amazon marketplace). A small digital start-up does not have the power to establish new standards or influence politicians in regulatory processes. Competing against such big players is a risk for Digital entrepreneur success (Pan et al. 2018), which is in line with our findings.

Finding customers is a challenge for a digital start-up because in the beginning they usually have solely little access to the market. This is emphasized by the suggestion to report the customer acquisition costs of lean start-ups instead of income statements and balance sheets, as it is common in traditional start-ups (Blank 2013). As stated in H1, a large network helps identify customers but the ability to contact them in the right way and to get in touch with new customers remains an important capability for the interviewed founders. In turn, potential customers must be open to the ideas of the digital start-up and must enable proof of concepts and test installations in order to be convinced and to establish a long-term partnership (Anderson et al. 2017), which is reflected in H8.

Financial support seem to be as important for digital start-ups as for traditional start-ups, which is reported by e.g. Pugliese et al. (2016). Especially in the first year after founding, governmental financial support is a huge factor because in most cases, the digital start-up is not profitable and its earnings cannot offset the living expenses of the founder. Furthermore, it is challenging for a digital start-up to recruit professionals (Bradel et al. 2019). Spigel (2017) elaborates on the positive effect of the *proximity to universities* in terms of educating talents and producing new knowledge. Even if the role of universities was discussed controversially among the interviewed founders, the proximity to universities for delivering top educated IT talents was undisputed.

5.3 Cultural

The development and maintenance of business networks and a simple access to critical stakeholders are important capabilities that positively influence the venture's performance (Iñaki 2002). Therefore, a positive and supporting *attitude of the area population* is a prerequisite. Picken (2017) elaborates on the substantial contribution of customer goodwill in product development. Without the openness for innovation of local companies, it would be very hard for a digital start-up to succeed. If the decision-makers of stakeholders are not willing to cooperate with the founded digital start-up, it is much harder for the venture to grow, which is reflected by H11.

Regardless of the customer target group and its global distribution, the interviewed founders suggest addressing local customers first, which is in line with existing entrepreneurial studies (Sapienza et al. 2003; Burgel et al. 2000). Moreover, a high degree of internationalization is linked with a higher risk of failure (Lasch et al. 2007). Through a successful local product placement, it becomes easy to get a first reference customer, who may promote the digital start-up in its contact network. Against this background, it is hard for a digital start-up to survive without a thorough *local customer awareness*, which is addressed in H12.

6 Conclusion and Outlook

This study investigates relevant environmental factors for the success of digital start-ups. Based on the Grounded Theory method and belonging guidelines (Glaser 1978; Urquhart und Fernández 2016), we developed a theoretical model that explains the environmental influence on Digital entrepreneur success and comprises 12 hypotheses, which partly confirm the results of existing start-up studies. For instance, we could show that the role of venture capital for a digital start-up is as important as for non-digital start-ups (Song et al. 2008; Azimzadeh et al. 2013) and that a supportive culture positively influence the success of a digital start-up, as expressed by Hopp and Stephan (2012). Furthermore, we found two new factors, compared to the framework for relational organization of entrepreneurial ecosystems (Spigel 2017): *Competitive environment* and *Living conditions*, whereas the latter seems to be less relevant for digital start-ups. In comparison with the results of a comprehensive literature review on IT start-up

success factors by Santisteban und Mauricio (2017), we additionally identified seven success factors that are relevant for a digital start-up. Based on the results, we present a theoretical model that contributes to the entrepreneurship and IS body of knowledge. Practitioners benefit from the results in getting guidance for building or improving an entrepreneurial digital start-up ecosystem.

Despite a thorough research process, the expressive power of the study is limited. First, all interviewees are located in Germany, which implies that their environment is quite similar, or even the same. Second, we used the environmental factors of the relational organization of entrepreneurial ecosystems (Spigel 2017) as a theoretical lens for the findings. Other theoretical perspectives may lead to the emergence of different categories. Third, our analysis does not focus on investigating interrelations of the different factors. In line with Spigel (2017), we assume the existence of relationships among factors.

We encourage researchers to perceive the current model as a starting point for further model refinements through extending the sample size. It is of particular interest to see whether the results can be confirmed by interviews with founders in other countries. From a quantitative perspective, the next step is the conduction of a survey among established digital start-ups to confirm the theoretical model.

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