

An exploratory conceptual model for digital entrepreneurs within entrepreneurial ecosystems
Jungcharoensukying, Ekapong;Feller, Joseph;O'Flaherty, Brian;Treacy, Stephen
2020-09
Jungcharoensukying, E., Feller, J., O'Flaherty, B. and Treacy, S. (2020) 'An exploratory conceptual model for digital entrepreneurs within entrepreneurial ecosystems', European Conference on Innovation and Entrepreneurship, Rome, Italy, 17-18 September, pp. 789-797. doi: 10.34190/EIE.20.221
Conference item
https://www.proquest.com/docview/2453908267/ abstract/520517CBEC824129PQ/1?accountid=14504 - 10.34190/ EIE.20.221
© 2020, the Authors. Published by Academic Conferences International Limited. Reproduced with permission of copyright owner. Further reproduction prohibited without permission.
2025-07-04 06:38:27
https://hdl.handle.net/10468/11405



An Exploratory Conceptual Model for Digital Entrepreneurs Within Entrepreneurial Ecosystems

Ekapong Jungcharoensukying, Joseph Feller, Brian O'Flaherty and Stephen Treacy University College Cork, Ireland

117220715@umail.ucc.ie

jfeller@ucc.ie bof@ucc.ie

Stephen.treacy@ucc.ie
DOI: 10.34190/EIE.20.221

Abstract: The entrepreneurial ecosystem is a well-known concept in supporting the creation and growth of entrepreneurs, driving the economy in a region. However, entrepreneurship is evolving, as more and more novel digital technologies are introduced into our lives. Accordingly, this paper focuses on digital entrepreneurs, who are defined as the entrepreneurs, who utilize innovation based on digital technology to create economic or social value by starting new ventures or transform existing ones (European Commission, 2015), and the relevant ecosystem that supports them. The change in the relationship between digital entrepreneurs and an entrepreneurial ecosystem, as they evolve towards digital products and customer engagement is the focus of this research. We reviewed the literature on the topic of digital entrepreneurs and entrepreneurial ecosystem using a concept-centric matrix, capturing 14 elements of an entrepreneurial ecosystem. These elements include networks, policy and government, professional and support services, capital services, human capital, culture, markets, knowledge sources, intermediaries, informal networks, leadership, physical infrastructure, engagement, and cooperative companies. The identified elements were then used to develop a conceptual framework, which will form the basis for the research strategy. This study sets out to establish the existence of these elements in the ecosystems and the extent of their usefulness. Therefore, this paper seeks to address the research gap of how digital entrepreneurs utilize each ecosystem element to understand their importance in the conceptual framework. We intend to conduct an exploratory quantitative research approach, gathering data from start-up digital entrepreneurs that are engaged in an entrepreneurial ecosystem, by using a data instrument derived from the conceptual framework. Then, we will analyze the data using descriptive and bi-variate statistical tools to uncover causal relations between the elements. The next phase of the research will involve case studies, where we plan to use the updated conceptual framework to undertake in-depth interviews to establish the context of digital entrepreneurial ecosystems.

Keywords: digital entrepreneur, entrepreneurial ecosystem, entrepreneurial process

1. Introduction

The success of famous entrepreneurs such as Bill Gates or Mark Zuckerberg has been inspired many younger generations to the entrepreneurship. Many tried to duplicate their success by studying characteristics of these entrepreneurs, however, the credits for their success are not from individual entrepreneurs alone, but also contributed to by external institutions that systematically support the creation and growth of their ventures (Radosevic & Yoruk, 2013). Entrepreneurial ecosystems are known to effectively and successfully support young startup entrepreneurs to set up their own business and further encouraging the progress of them (Robertson, Pitt, & Ferreira, 2020; van Rijnsoever, 2020). These entrepreneurs, who receive the offered supports from the ecosystem, are evidently more in number and more impactful to the economy comparing to other practices (Leffel & Agrawal, 2014). However, the way the new generation of entrepreneur works is slowly changing with more digital technologies become accessible. These so-called digital entrepreneurs work differently and can easily access alternative support structures on the internet similar to what an entrepreneurial ecosystem can offer. Unfortunately, there is a lack of evidence that explores how these changes can affect the entrepreneurial ecosystem (Elia, Margherita, & Passiante, 2020).

It is agreed that new digital innovations are crucial to economic growth and the entrepreneurs, who utilize them to establish a new venture or transform existing ones, not only make a profit for themselves but also vitalize the economy around them (Lindholm-Dahlstrand, Andersson, & Carlsson, 2019; Robertson et al., 2020; Tripathi, Seppänen, Boominathan, Oivo, & Liukkunen, 2019; van Rijnsoever, 2020). By producing innovative products, they strengthen their markets and by expansion, create job opportunities in their immediate area. There is evidence highlighting that entrepreneur's businesses can be responsible for job creation on a large scale (Tripathi, Oivo, Liukkunen, & Markkula, 2019). Therefore, encouraging new entrepreneurs and supporting the growth of existing ones has become an important issue to policymakers and academics seeking to further energize the economy for their cities or even nations. The entrepreneurial ecosystem is a well-recognized

concept that aims to create an influential environment and gather a variety of support entities needed by entrepreneurs into a region (Robertson et al., 2020). Entrepreneurial ecosystems have become popularized by successful exemplars, including Silicon Valley and Boston's Route 128 (Du, Pan, Zhou, & Ouyang, 2018). Given the achievements of these cases, cities all around the world have been trying to replicate their success with an ecosystem of their own (Startup Genome, 2018). Therefore, the two main goals of entrepreneurial ecosystems are: (1) to enhance their regional economy, and (2) to facilitate the birth of new entrepreneurial ventures and the growth of the already established ones.

Within this environment, a community of inventors and innovators already operating within the ecosystem can offer ideas for new products or services to these new entrants, and in some cases, they may even help translate those ideas into business plans (Isenberg, 2011). After that, the universities or colleges which are usually stationed within the ecosystem's area can provide skilled workers or training for the new ventures. Similarly, venture capitalists or angel investors in the ecosystem can support them by funding the establishment of a new business or in a business expansion (Cohen, 2006). The vicinity of the ecosystem will also become the first market for those new firms' products (Stam, 2015). Moreover, the Government can also support them with beneficial policies to further their chances of survival (Spigel, 2017). Furthermore, the network among the actors within the ecosystem can fluidly guide the entrepreneurs from one service they needed to another along their entrepreneurial process (Bell-Masterson & Stangler, 2015). These supports undoubtedly help the entrepreneurs to achieve their goals which, in turn, help the ecosystem realize another goal that is stimulating its economy.

However, with the advance of digital technologies and the internet, information and support platforms became easier to access by the majority of people all around the world in this age of the 4th industrial revolution. The entrepreneurs are also changing in this new digital environment. Their ways of operations rely more on digital tools. And there are online platforms that offer supports similar to that offered by entrepreneurial ecosystems such as crowdsourcing where entrepreneurs can raise funding from the mass instead of capital services from venture capital or angel investors, online community platforms that offer consultation on business ideas, or online marketplaces that even more suits to digital products. Not only that, evidently, Hernández and González (2016) report that entrepreneurs found some supports, in an ecosystem, are not relevant to their business. Thus, it is time to reaffirm the usefulness of those supports offered by the entrepreneurial ecosystem in order to adapt to the changing demand of digital entrepreneurs.

In section 2, we explain our method of literature review and discuss the concept-centric matrix. Then, in section 3, we discuss the background of the entrepreneur, digital entrepreneur, the entrepreneurial ecosystem, and its support elements and their alternatives. Next, in section 4,

2. Methodology

This review explores the entrepreneurial ecosystem concept where digital technology is involved. We select the ScienceDirect database to explore as it offers a wide variety of journals. We used search phrases "entrepreneurial ecosystem" and "digital technology" to look between 2016-2020 with article type as "research article". However, it yields only 38 search results with only 6 related to the entrepreneurial ecosystem. Realizing that the search phrases are too narrow, we change search phrases to "entrepreneurial ecosystem" and "technology" instead while the other criteria remain the same. This time, the search yields 195 results.

After the search, the results are screened in detail to select only relevant papers. We exclude articles we determined unrelated to the entrepreneurial ecosystem. For example, an article with only the search phrase "technology" in its title but is not related to the entrepreneurial ecosystem at all. We also include a few papers, which even though there are no search phrases we used at all in the title, are related to the entrepreneurial ecosystem. After screening out irrelevant papers, there are 35 papers as the final results for our review.

2.1 The concept-centric matrix

Introduced by Webster and Watson (2002) to emphasize that literature review should be done in a conceptcentric approach, not an author-centric approach. This matrix was designed to capture key concepts found in the selected literature without subjective bias. The captured concepts from literature can, then, be used to categorize the papers in a meaningful way that help define topic area such as theoretical issues or gaps in the literature.

We utilize the concept-centric matrix on the selected papers. Several themes of studies emerge, for example, topics that concern the survival of entrepreneurial ecosystems such as the sustainability (Neumeyer & Santos, 2018; Tiba, van Rijnsoever, & Hekkert, 2020; Znagui & Rahmouni, 2019), the resilience of entrepreneurial ecosystem (Roundy, Brockman, & Bradshaw, 2017), the revival of an inactive one (Ghazinoory, Sarkissian, Farhanchi, & Saghafi, 2020; Reynolds & Uygun, 2018; Roundy, 2019), or the exaptation caused by disruptive innovation (Beltagui, Rosli, & Candi, 2020). Some papers tackle the emergence of entrepreneurial ecosystems (Roundy, Bradshaw, & Brockman, 2018; Wiszniewski, 2019). Additionally, some papers studies in specific areas such as the roles of women and how they are treated in entrepreneurial ecosystems (Berger & Kuckertz, 2016; Lawson, 2019), the making of a green entrepreneurial ecosystem (Zhao, Shang, & Song, 2019), the education on the entrepreneurial ecosystem (Jha, 2018), or the digital entrepreneurship and entrepreneurial ecosystem (Chandna & Salimath, 2020; Elia et al., 2020; Han, Ruan, Wang, & Zhou, 2019). Meanwhile, Scaringella and Radziwon (2018) look back and compare the entrepreneurial ecosystem with similar concepts that come before. Moreover, the majority of papers concern about what and how to make a successful entrepreneurial ecosystem (Arenal et al., 2020; Dedehayir, Mäkinen, & Ortt, 2018; Feng et al., 2019; Fuster, Padilla-Meléndez, Lockett, & del-Águila-Obra, 2019; Kahle, Marcon, Ghezzi, & Frank, 2020; Kantis, Federico, & García, 2020; Kuckertz, 2019; Prencipe, Corsi, Rodríguez-Gulías, Fernandez, & Rodeiro-Pazos, 2020; Pustovrh, Rangus, & Drnovšek, 2020; Sarma & Sunny, 2017; Stephens, Butler, Garg, & Gibson, 2019; Sun, Zhang, Cao, Dong, & Cantwell, 2019; Tripathi, Oivo, et al., 2019; Tripathi, Seppänen, et al., 2019; van Rijnsoever, 2020; Xu, Wu, Minshall, & Zhou, 2018; Znagui & Rahmouni, 2019).

From the sample of papers analysed, there are only three papers among the selected that focus on digital entrepreneurs and only one of those that discuss how entrepreneurs turning into digital ones affect how their entrepreneurial process (Elia et al., 2020). Furthermore, none of them raises the implication of that change upon the elements that make a successful entrepreneurial ecosystem. Therefore, we intend to address this research gap that is how the change in the entrepreneurial process of digital entrepreneurs affects the supportive elements offered by the entrepreneurial ecosystem.

3. Literature review

In this section, we discuss entrepreneurship and digital entrepreneurship and their differences. After that, we explore the entrepreneurial process that happens during entrepreneurship. Then, we review the entrepreneurial ecosystem, the concept that is made to support entrepreneurship. And lastly, we consider the elements that make a successful entrepreneurial ecosystem.

3.1 Entrepreneurship and digital entrepreneurship

Entrepreneurship happened all the time in human history long before it was conceptualized (Casson & Casson, 2014). It has been defined and redefined many times over. Each time, more characteristics were added to it. In 1965, Joseph Alois Schumpeter (1965) defined entrepreneurship as "individuals who exploit market opportunity through technical and/or organizational innovation". In this definition, the first feature of entrepreneurship is specified which is they utilize innovation in pursuit of business opportunity. Later, Hébert and Link (1989) add that the entrepreneurs have to face many judgmental decision-making situations in their entrepreneurship. Then, Drucker (2014) suggests in his definition that entrepreneurship involves taking risks especially financial risk. To emphasize on taking risks characteristic, Stevenson (2000) gives his definition of entrepreneurship as "Entrepreneurship is the pursuit of opportunity beyond the resources you currently control." Additionally, Joseph A Schumpeter (2010) put in another feature of entrepreneur that entrepreneurship includes both those who create new ventures and who transform the existing ones with innovations. Moreover, Morris, Lewis, and Sexton (1994) propose that entrepreneurship is a process activity which means entrepreneurship is not simply characteristics of entrepreneurs but rather actions the happen over time in the entrepreneurial process. Therefore, entrepreneurship is a process of individuals utilizing innovation to take risks building new ventures, or transforming existing ones in order to exploit the market opportunity and have to face difficult decisions along the process.

Digital entrepreneur refers to entrepreneurs who are familiar with digital tools and online resources which make starting new ventures easier than ever (Rathee & Rajain, 2017). European Commission (2015) gives a definition of digital entrepreneurship as "Digital entrepreneurship embraces all new ventures and the transformation of existing businesses that drive economic and/or social value by creating and using novel digital technologies." Though it does not mention about taking risks and decision making, it is quite clear that the differences between

digital entrepreneurs and traditional ones are the utilization of digital technologies that change the ways of business operations. Furthermore, Nambisan (2017) offers more characteristics that further distinguish them which is the outcomes, processes, and supports are less bounded in digital entrepreneurs' cases. The entrepreneurial outcomes refer to products or services which can be partially digitalized or fully digital. The partially digitized products may hold many functions and capabilities, and potentially the software within the products can be fixed or upgraded online. Even better, in case of fully digitized products, they have no physical restraint at all which means no need for stocking space and can reach out to customers all around the world at once. Next, the entrepreneurial process, which usually advances step by step, can now go in a parallel fashion. For example, traditionally, a firm starts doing business in the local market first, then, later on, expand to new areas until finally to new countries. With the help of the internet, digital entrepreneurs' products can be globalized through digital marketplaces at once. Finally, some entrepreneurial supports are not limited to locations which are the entrepreneurial ecosystems anymore.

3.2 Entrepreneurial process

As mentioned in the above subsection, Morris et al. (1994) insist that entrepreneurship should be viewed as a process, not just some attributes of the entrepreneurs. His definition expands our understanding of entrepreneurship from their characteristics to their actions overtime in their path of entrepreneurship (Anderson, 2000). This expansion will allow further understanding of how the entrepreneurial ecosystem support entrepreneurship by matching up each entrepreneurial process with ecosystem supports.

The entrepreneurial process was proposed by Ahmadi (2003) as 3 phases: (1) initiation phase where new entrepreneurs draw up product ideas and business plan, (2) establishment phase where ideas and plans are implemented into an actual business, and (3) growth phase where the business is stabled and expansion are planned and executed. This proposed process covers all the lifetime of entrepreneurship. However, another version with more details in-between phases by suggested by Ruef (2005). It focuses more on the activities in the entrepreneurial process as follows: (1) Initiation phase where founders commit themselves to entrepreneurial path, (2) Resource mobilization phase where founders prepare their business plan and procure funding, (3) Legal establishment phase where founders legalize their firm, (4) Social organization phase where founders recruit needed employees, and (5) Operational startup phase where the venture start its operation. Though this version expands the initiation and establishment phase of Ahmadi (2003) into 5 phases of activities, it overlooks the growth phase entirely. Moreover, Jones and Coviello (2005) expand the growth phase into 2 steps which are the growth phase and the internationalization or globalization phase as the 2 phases are on a different scale and should be treated differently.

Therefore, we combine and propose a working entrepreneurial process for our study as seven stages including (1) Initiation, (2) Resource mobilization, (3) Legal establishment, (4) Social organization, (5) Operational startup, (6) Growth, and (7) globalization.

3.3 Entrepreneurial ecosystem

There are many similar concepts that come before the entrepreneurial ecosystem such as environments for entrepreneurs or entrepreneurial systems. Evidently, however, the usage of the term entrepreneurial ecosystem has overtaken other concepts (Malecki, 2018). When the entrepreneurial ecosystem is still called an entrepreneurial system, Spilling (1996) defines it as "The complexity and diversity of actors, roles, and environmental factors that interact to determine the entrepreneurial performance of a region or locality." This definition suggests that as the ecosystem consists of actors with roles and environment factors who work together toward a goal, entrepreneurial performance, in a region. Later, Cohen (2006) suggests that "Entrepreneurial ecosystems represent a diverse set of inter-dependent actors within a geographic region that influence the formation and eventual trajectory of the entire group of actors and potentially the economy as a whole. Entrepreneurial ecosystems evolve through a set of interdependent components which interact to generate new venture creation over time." He expands that the ecosystem benefits, not only the entrepreneurs their main target but also the actors and that regional economy as Kuckertz (2019) suggest that a well-managed ecosystem should be. Furthermore, the definition emphasizes that the outcomes of the entrepreneurial ecosystem happen over time. It stresses that the supports offered by the entrepreneurial ecosystem are given to the entrepreneurs along the entrepreneurial process, not instantly happen. Then, Audretsch (2015) offers 3 distinct characteristics of the entrepreneurial ecosystem as (1) entrepreneurial ecosystem are bounded to a geographic location, (2) there can be many institutions, organizations, enterprises, or even individuals as

members of the entrepreneurial ecosystem, and (3) to be considered a part of the ecosystem, an entity need to contribute toward entrepreneurial performance rather than being co-located only. Therefore, an entrepreneurial ecosystem is the gathering of many interdependent entities, no matter big or small, who contribute toward entrepreneurial performance over time in a region which, in turn, benefit those entities and regional economy.

3.4 Entrepreneurial ecosystem's elements

There are multiple attempts to conceptualize what makes a successful entrepreneurial ecosystem in terms of its attributes or elements. Cohen (2006) suggests 7 components that make a sustainable entrepreneurial ecosystem as (1) informal network which is the informal relationship of the entrepreneur such as family and friends, (2) formal network among the actors in an ecosystem, (3) university that provide training and innovation, (4) government who support entrepreneurs with policies, (5) professional and support services such as legal or accounting services, (6) capital services who provide funding for entrepreneurs, and (7) talent pool which is the sources of skilled employees for hire. This study signifies the importance of networks both formal and informal while putting the actors into a group of services they provide. Then Isenberg (2011) brings 2 more elements into academic attention which are, first, the culture that inspires individuals to take risks and become entrepreneurs, and, second, the market that is the first group of customers and, potentially is a social network that attracting more customers. Later, 4 more elements are introduced by Stam (2015) as (1) leadership which are successful entrepreneurs who are willing to inspire and support new entrepreneurs to settle in their ecosystem, (2) intermediaries which are mentors, who support new entrepreneurs by business knowledge and networks, such as accelerators or incubators, (3) engagement which is events that bring actors together and forming new networks, and (4) companies within the region who are willing to cooperate and support new entrepreneurs. Furthermore, Spigel (2017) suggests elements that make a successful entrepreneurial ecosystem and adds physical infrastructure to our conceptual framework. Among these studies, some elements are suggested by multiple scholars, however, the university element, first suggested by Cohen (2006), was argued by Stam (2015) that it should not be limited to university but refer to any sources of knowledge both public and private organizations. Therefore, 14 elements are identified from the literature as supportive elements that directly or indirectly facilitate the birth and growth of entrepreneurs. The definition for each element is shown in Table 1.

Table 1: Entrepreneurial ecosystem elements' definition

Elements	Working definitions
Ecosystem	Stam (2015) suggests that holding a large number of community events within the ecosystem can
engagement	raise the presence of the entrepreneurial ecosystem and continuously build more networks in the
	ecosystem. Such events are pitching day, hackathons, or boot camps. These activities create
	shared common intentions, patterns of thinking, and strengthen the association between actors
	(Roundy et al., 2018).
Formal network	This type of network is established as cooperation among organizations that are actors within the
	entrepreneurial ecosystem. With this network, each actor who gives support to entrepreneurs can
	guide them to the next supporting actors that the entrepreneurs need (Cohen, 2006). Additionally,
	this social network among actors and entrepreneurs means the sharing of knowledge and skills
	(Spigel, 2017).
Culture	The societal norms in the region that admire successful entrepreneurs, tolerate risks and mistakes,
	encourage ambition, invention, and wealth creation (Isenberg, 2011). Investing in cultural
	resources such as public arts or community gardens can attract entrepreneurs, actors, or even
	skilled workers to the region (Roundy, 2019).
Physical	This refers to communication infrastructure, transportation infrastructure, and availability of office
Infrastructure	space which will allow the creation and growth of new ventures (Spigel, 2017). Cities that become
	an innovation hub attract young entrepreneurs to them (Sarma & Sunny, 2017).
Market	Markets provide first customers with first feedbacks who then, provide access to more customers
	through social networks (Isenberg, 2011).
Government and	This refers to the support given by the government, at any level, through programs or regulations.
Policies	The support might be direct funding or policies that make the creation of new ventures easier
	(Spigel, 2017).
Leadership	Leadership refers to a group of successful entrepreneurs who give advice and inspiration to new
	entrepreneurs (Stam, 2015; Tiba et al., 2020).
Informal network	This element refers to the entrepreneur's own informal network that can be family, friends,
	colleagues, or even companies that the entrepreneur closely familiar with. This network can
	potentially provide advice or the first funding for establishing a new venture (Cohen, 2006).

Elements	Working definitions
Knowledge	The sources of knowledge such as universities generate new generations of entrepreneurs,
sources	knowledge spillovers through discussions, or even spin-off ventures using know-how from
	research (Prencipe et al., 2020; Spigel, 2017). Moreover, personnel from entrepreneurs' ventures
	can be trained for necessary skills by this actor (Cohen, 2006).
Professional and	Professional services are in demand even before the establishment of new ventures. Lawyers are
support services	the first service the entrepreneurs need to consult in order to patent their product or service, or
	legally start their business. After that, accounting, real estate, or insurance are the services that
	also support the entrepreneurs (Spigel, 2017). This also includes suppliers needed by
	entrepreneurs (Cohen, 2006).
Capital services	Access to funding from supportive venture capital, angel investors, or other forms of finance is
	critical to new ventures. Therefore, the density of these capital services should be high to provide
	access to funding to the entrepreneurs (Stam, 2015).
Talent pool	Ideally, an entrepreneurial ecosystem should have, at least, a source for all levels of employees in
	every area of expertise. The university is such a place and should be well-connect to the ecosystem
	network (Stam, 2015).
Intermediaries	Intermediaries are mentors and dealmakers who support entrepreneurs through advice on their
	product design or business plan. Then, they utilize the ecosystem network to guide the
	entrepreneurs to more support needed for each phase of entrepreneurship. These intermediaries
	are incubators, accelerators, or even those successful advisors who want to give back to the
	entrepreneurial ecosystem (Stam, 2015). These mentors also play an important role in building the
	ecosystem's network (van Rijnsoever, 2020).
Cooperative	Large companies in the ecosystem area should be encouraged to provide support programs to new
companies	startups (Stam, 2015).

4. Research strategy

We plan to conduct exploratory quantitative research based on our conceptual framework in order to understand the changes that occur upon the entrepreneurial process of digital entrepreneurs. The data will be gathered from the startup digital entrepreneurs who are participating or participated in an entrepreneurial ecosystem within the last 2 years to get accurate data that is not tainted by unreliable memory. Figure 1 shows the proposed conceptual framework.

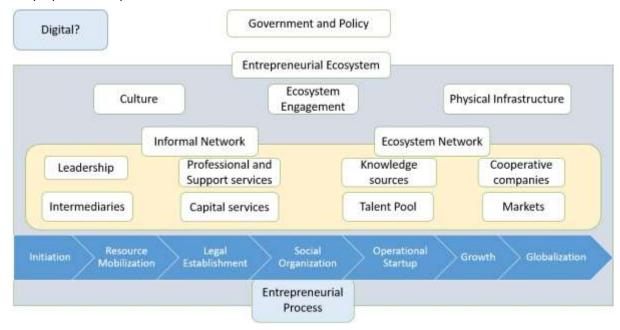


Figure 1: Conceptual framework on entrepreneurial ecosystem elements and entrepreneurial process

The theoretical framework we adopted is the assimilation of literature gathered and analyzed in the previous section. The entrepreneurial process is included in the conceptual framework because, as we define it in section 3.3, the entrepreneurial ecosystem enables improved entrepreneurial performance to startup that are members and the entrepreneurial process is the performance aspect of our conceptual framework. This conceptual framework will be our base in the forming of the structure for the data collection which we will attempt to confirm the existence of and the relationships between the elements of the digital ecosystem framework. Our

objective is to gain an understanding of the role of digital entrepreneurs and their evolved entrepreneurial process within the entrepreneurial ecosystem.

Then, in the data analysis phase, we use descriptive and bi-variate statistical tools to discover summary and causal relations between the elements. After that, we plan to use the updated conceptual framework to undertake in-depth interviews to establish the context of digital entrepreneurial ecosystems

5. Discussion

We propose a conceptual framework that can show a digital entrepreneurial ecosystem's support elements and the entrepreneurial process. This conceptual framework will be the base of the next phase of this study in learning what are the changes in entrepreneurial processes in the context of the digital entrepreneur as well as the delivery of the ecosystem in a digital manner. Partial elements of the ecosystem may indeed become more digital with subsequent implications on the services the ecosystem offers. There exists an absence of literature focusing on the evolution of supportive elements within these digital entrepreneurial ecosystems. We believe that after adapting entrepreneurial processes caused by entrepreneurs turning digital as suggested by Elia et al. (2020), the ecosystems also have to adapt themselves to this situation. Multiple online crowdsourcing platforms have emerged that offer digital entrepreneurial supports, for example, "OpenIDEO" or "Idea Bounty" which offers a place for digital entrepreneurs to get ideas from the online community in the product design process. Another example involves the platform "ioby" that offers fundraising services for local environmental projects. These alternative digital capital services may reduce, to some degree, the importance of those more traditional elements of capital services, such as angel investors and venture capitalists. The way in which digital entrepreneurs engage with the digital and traditional ecosystem is a key element in this research study.

6. Conclusion

This study reviews the literature on the interlinked subjects of the digital entrepreneurial ecosystem and the digital entrepreneur. The concepts of an entrepreneurial ecosystem, as found, in the literature were reviewed and 14 support elements within entrepreneurial ecosystem were identified as ecosystem engagement, leadership, informal network, formal network, intermediaries, professional and support services, capital services, knowledge sources, talent pool, cooperative companies, culture, government and policies, physical infrastructure, and markets. These elements as well as the entrepreneurial process were incorporated to create a conceptual framework as a theoretical lens to explore the changes in the entrepreneurial processes of digital entrepreneurs and subsequently to the support elements of the entrepreneurial ecosystem. After that, we outline our research plan for the next phase of the study. This research study will contribute to knowledge by developing a better understanding of the digital entrepreneurial processes and the emerging digital entrepreneurial ecosystem capabilities.

References

Ahmadi, A. (2003). The entrepreneurial process: An institutional perspective. rapport nr.: FE-reports (2003-396).

Anderson, A. R. (2000). The protean entrepreneur: the entrepreneurial process as fitting self and circumstance. *Journal of Enterprising Culture, 8*(03), 201-234.

Arenal, A., Armuña, C., Feijoo, C., Ramos, S., Xu, Z., & Moreno, A. (2020). Innovation ecosystems theory revisited: The case of artificial intelligence in China. *Telecommunications Policy*, 101960.

Audretsch, D. B. (2015). Everything in its place: Entrepreneurship and the strategic management of cities, regions, and states: Oxford University Press.

Bell-Masterson, J., & Stangler, D. (2015). Measuring an entrepreneurial ecosystem. Available at SSRN 2580336.

Beltagui, A., Rosli, A., & Candi, M. (2020). Exaptation in a digital innovation ecosystem: The disruptive impacts of 3D printing. *Research policy*, 49(1), 103833.

Berger, E. S., & Kuckertz, A. (2016). Female entrepreneurship in startup ecosystems worldwide. *Journal of business research*, 69(11), 5163-5168.

Casson, M., & Casson, C. (2014). The history of entrepreneurship: Medieval origins of a modern phenomenon. *Business History*, *56*(8), 1223-1242.

Chandna, V., & Salimath, M. S. (2020). When technology shapes community in the cultural and craft Industries: Understanding virtual entrepreneurship in online ecosystems. *Technovation*, *92*, 102042.

Cohen, B. (2006). Sustainable valley entrepreneurial ecosystems. Business Strategy and the Environment, 15(1), 1-14.

Dedehayir, O., Mäkinen, S. J., & Ortt, J. R. (2018). Roles during innovation ecosystem genesis: A literature review. *Technological Forecasting and Social Change, 136,* 18-29.

Drucker, P. (2014). *Innovation and entrepreneurship*: Routledge.

- Du, W., Pan, S. L., Zhou, N., & Ouyang, T. (2018). From a marketplace of electronics to a digital entrepreneurial ecosystem (DEE): The emergence of a meta-organization in Zhongguancun, China. *Information Systems Journal, 28*(6), 1158-1175.
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change, 150,* 119791.
- European Commission. (2015). Digital Transformation of European Industry and Enterprises: A report of the Strategic Policy Forum on Digital Entrepreneurship. Retrieved from http://ec.europa.eu/DocsRoom/documents/9462/attachments/1/translations/en/renditions/native
- Feng, N., Fu, C., Wei, F., Peng, Z., Zhang, Q., & Zhang, K. H. (2019). The key role of dynamic capabilities in the evolutionary process for a startup to develop into an innovation ecosystem leader: An indepth case study. *Journal of Engineering*
- Fuster, E., Padilla-Meléndez, A., Lockett, N., & del-Águila-Obra, A. R. (2019). The emerging role of university spin-off companies in developing regional entrepreneurial university ecosystems: The case of Andalusia. *Technological Forecasting and Social Change*, 141, 219-231.

and Technology Management, 54, 81-96.

- Ghazinoory, S., Sarkissian, A., Farhanchi, M., & Saghafi, F. (2020). Renewing a dysfunctional innovation ecosystem: The case of the Lalejin ceramics and pottery. *Technovation*, 102122.
- Han, J., Ruan, Y., Wang, Y., & Zhou, H. (2019). Toward a complex adaptive system: The case of the Zhongguancun entrepreneurship ecosystem. *Journal of business research*.
- Hébert, R. F., & Link, A. N. (1989). In search of the meaning of entrepreneurship. Small Business Economics, 1(1), 39-49.
- Hernández, C., & González, D. (2016). Study of the start-up ecosystem in Lima, Peru: Collective case study. *Latin American Business Review*, 17(2), 115-137.
- Isenberg, D. (2011). The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship. *Presentation at the Institute of International and European Affairs*.
- Jha, S. K. (2018). Entrepreneurial ecosystem in India: Taking stock and looking ahead. *IIMB management review, 30*(2), 179-188.
- Jones, M. V., & Coviello, N. E. (2005). Internationalisation: conceptualising an entrepreneurial process of behaviour in time. *Journal of International Business Studies*, *36*(3), 284-303.
- Kahle, J. H., Marcon, É., Ghezzi, A., & Frank, A. G. (2020). Smart Products value creation in SMEs innovation ecosystems. Technological Forecasting and Social Change, 156, 120024.
- Kantis, H. D., Federico, J. S., & García, S. I. (2020). Entrepreneurship policy and systemic conditions: Evidence-based implications and recommendations for emerging countries. *Socio-Economic Planning Sciences*, 100872.
- Kuckertz, A. (2019). Let's take the entrepreneurial ecosystem metaphor seriously! *Journal of Business Venturing Insights,* 11, e00124.
- Lawson, L. (2019). Women working in the Thai coloured gemstone industry: Insights from entrepreneurial ecosystems. *The Extractive Industries and Society, 6*(4), 1066-1074.
- Leffel, C. H. A., & Agrawal, L. d. I. V. M. (2014). Accelerating collegiate entrepreneurship (ACE): The architecture of a university entrepreneurial ecosystem encompassing an intercollegiate venture experience. *Journal of Business & Entrepreneurship*, 95.
- Lindholm-Dahlstrand, Å., Andersson, M., & Carlsson, B. (2019). Entrepreneurial experimentation: a key function in systems of innovation. *Small Business Economics*, *53*(3), 591-610.
- Malecki, E. J. (2018). Entrepreneurship and entrepreneurial ecosystems. Geography Compass, 12(3), e12359.
- Morris, M. H., Lewis, P. S., & Sexton, D. L. (1994). Reconceptualizing entrepreneurship: an input-output perspective. *SAM Advanced Management Journal*, *59*(1), 21.
- Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. Entrepreneurship Theory and Practice, 41(6), 1029-1055.
- Neumeyer, X., & Santos, S. C. (2018). Sustainable business models, venture typologies, and entrepreneurial ecosystems: A social network perspective. *Journal of cleaner production*, *172*, 4565-4579.
- Prencipe, A., Corsi, C., Rodríguez-Gulías, M. J., Fernandez, S., & Rodeiro-Pazos, D. (2020). Influence of the regional entrepreneurial ecosystem and its knowledge spillovers in developing successful university spin-offs. *Socio-Economic Planning Sciences*, 100814.
- Pustovrh, A., Rangus, K., & Drnovšek, M. (2020). The role of open innovation in developing an entrepreneurial support ecosystem. *Technological Forecasting and Social Change*, 152, 119892.
- Radosevic, S., & Yoruk, E. (2013). Entrepreneurial propensity of innovation systems: Theory, methodology and evidence. *Research policy*, 42(5), 1015-1038.
- Rathee, R., & Rajain, M. P. (2017). ENTREPRENEURSHIP IN THE DIGITAL ERA. *Asia Pacific Journal of Research in Business Management*, 8(6).
- Reynolds, E. B., & Uygun, Y. (2018). Strengthening advanced manufacturing innovation ecosystems: The case of Massachusetts. *Technological Forecasting and Social Change, 136,* 178-191.
- Robertson, J., Pitt, L., & Ferreira, C. (2020). Entrepreneurial ecosystems and the public sector: A bibliographic analysis. *Socio-Economic Planning Sciences*, 100862.
- Roundy, P. T. (2019). Back from the brink: The revitalization of inactive entrepreneurial ecosystems. *Journal of Business Venturing Insights, 12*, e00140.

- Roundy, P. T., Bradshaw, M., & Brockman, B. K. (2018). The emergence of entrepreneurial ecosystems: A complex adaptive systems approach. *Journal of business research*, 86, 1-10.
- Roundy, P. T., Brockman, B. K., & Bradshaw, M. (2017). The resilience of entrepreneurial ecosystems. *Journal of Business Venturing Insights, 8,* 99-104.
- Ruef, M. (2005). Origins of organizations: The entrepreneurial process. Research in the Sociology of Work, 15, 63-100.
- Sarma, S., & Sunny, S. A. (2017). Civic entrepreneurial ecosystems: Smart city emergence in Kansas City. *Business Horizons*, 60(6), 843-853.
- Scaringella, L., & Radziwon, A. (2018). Innovation, entrepreneurial, knowledge, and business ecosystems: Old wine in new bottles? *Technological Forecasting and Social Change, 136,* 59-87.
- Schumpeter, J. A. (1965). Economic Theory and Entrepreneurial History. In A. HG (Ed.), *Explorations in enterprise*. Cambridge, MA: Harvard University Press.
- Schumpeter, J. A. (2010). Capitalism, socialism and democracy: routledge.
- Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice*, 41(1), 49-72.
- Spilling, O. R. (1996). The entrepreneurial system: On entrepreneurship in the context of a mega-event. *Journal of business research*, *36*(1), 91-103.
- Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies*, 23(9), 1759-1769.
- Startup Genome. (2018). Global Startup Ecosystem Report 2018. Retrieved from https://startupgenome.com/reports/global-startup-ecosystem-report-gser-2018
- Stephens, B., Butler, J. S., Garg, R., & Gibson, D. V. (2019). Austin, Boston, Silicon Valley, and New York: Case studies in the location choices of entrepreneurs in maintaining the Technopolis. *Technological Forecasting and Social Change, 146,* 267-280.
- Stevenson, H. H. (2000). Why entrepreneurship has won. Coleman White Paper, 1-8.
- Sun, S. L., Zhang, Y., Cao, Y., Dong, J., & Cantwell, J. (2019). Enriching innovation ecosystems: The role of government in a university science park. *Global Transitions*, 1, 104-119.
- Tiba, S., van Rijnsoever, F., & Hekkert, M. P. (2020). The lighthouse effect: How successful entrepreneurs influence the sustainability-orientation of entrepreneurial ecosystems. *Journal of cleaner production*, 121616.
- Tripathi, N., Oivo, M., Liukkunen, K., & Markkula, J. (2019). Startup ecosystem effect on minimum viable product development in software startups. *Information and Software Technology*, 114, 77-91.
- Tripathi, N., Seppänen, P., Boominathan, G., Oivo, M., & Liukkunen, K. (2019). Insights into startup ecosystems through exploration of multi-vocal literature. *Information and Software Technology, 105*, 56-77.
- van Rijnsoever, F. J. (2020). Meeting, mating, and intermediating: How incubators can overcome weak network problems in entrepreneurial ecosystems. *Research policy*, 49(1), 103884.
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS quarterly*, xiii-xxiii.
- Wiszniewski, B. (2019). Building Polish space sector—from small islands of excellence to a national innovation ecosystem. *IFAC-PapersOnLine*, 52(8), 211-220.
- Xu, G., Wu, Y., Minshall, T., & Zhou, Y. (2018). Exploring innovation ecosystems across science, technology, and business: A case of 3D printing in China. *Technological Forecasting and Social Change*, 136, 208-221.
- Zhao, X., Shang, Y., & Song, M. (2019). Industrial structure distortion and urban ecological efficiency from the perspective of green entrepreneurial ecosystems. *Socio-Economic Planning Sciences*, 100757.
- Znagui, Z., & Rahmouni, B. (2019). What ecosystem model to support the creation of social innovation technopoles? *Procedia Computer Science, 158,* 877-884.

Online Communication, is a board member of the SUN scholarship start-up network and connects entrepreneurs. Her main topics are automated marketing, entrepreneurship and innovation for people interested in starting a business.

Blanka Jarolimova is a senior lecturer at Tomas Bata University in Zlin. She graduated from Technical University in Brno, majoring in Management and Economics in 1995. She studied at the Oxford University, UK, where she gained scholarship at ESCP-EAP. For many years, she is also a member of the Chamber of the Tax Advisers of the Czech Republic. Taxation is her main area of research and expertise.

Ekapong Jungcharoensukying got a Thai Government scholarship to pursuit a PhD in Business Information System programme, Cork University Business School, University College Cork (UCC), Ireland. Before receiving this scholarship, he had been teaching in School of Information Technology, King Mongkut's University of Technology Thonburi (KMUTT) in Thailand.

Alexandros Kakouris, MsC, PhD, PhD, adjunct lecturer in entrepreneurship and innovation at University of Peloponnese, at Hellenic Open University and also innovation consultant at National Observatory of Athens. PhD in Physics, PhD in Entrepreneurship and MSc in Adult Education. Been involved in entrepreneurship since 2006 researching educational and learning issues. His special interest concerns fostering entrepreneurship and innovation to science graduates and the support of youth entrepreneurship through teaching and counselling. He also specialises in nascent entrepreneurship, creativity, transformative and experiential learning.

Maria Kamariotou is researcher associate at the Department of Applied Informatics, School of Information Sciences, University of Macedonia, Greece. She graduated from the University of Macedonia with a degree in Applied Informatics Department. She is author and also acts as reviewer for scientific journals and conference proceedings.

Noora Khalid Ali. MSc in Business, Kingdom of Bahrain. Holds a position KKB Bank, Bahrain.

Florian Kidschun is a researcher at Fraunhofer Institute for Production Systems and Design Technology (IPK), Division Corporate Management in Berlin, Germany. He studied Business Engineering at Technical University of Berlin and Dresden. Since joining Fraunhofer in 2015, he conducted international consulting projects in Europe and Brazil with project responsibility on Benchmarking, Strategic Business Development and Best Cost Country Sourcing. The focus of his research lies on the digital transformation of organizations.

Monika Klimontowicz is an Assistant Professor at University of Economics in Katowice, Department of Banking and Financial Markets. Her scientific interests focus on business strategy, banking innovations, creating value for customers, knowledge and intellectual capital, and competition on banking market. She is an author of over 60 scientific publications including 5 monographs. The results of her research are the topic of lectures delivered at the domestic and foreign universities in among others Finland, France, Spain, Portugal, Germany.

Evgenii A. Konnikov PHD, Associate Professor of the Higher School of Engineering and Economics in Peter the Great Saint-Petersburg Polytechnic University (Saint-Petersburg, Russia) since 2014. Research interests: application of the fuzzy logic toolkit to the assessment of complex economic phenomena and systems. Author of 22 publications indexed in Scopus.

Kseniya M. Kozinskaya is a post-graduate student in the Ural Federal University named after the First President of Russia B.N Yeltsin. Also, currently she is a Junior Researcher in the Institute of Economics, the Ural Branch of Russian Academy of Sciences. The field of research interests is institutional economics and social entrepreneurship.

Assel Kurmantayeva is the Development Manager at Civil Society DevelopmentAssociation "ARGO". She holds the Bachelor degree in Economics from the University of Essex and PhD student at Almaty Management University. She participated in the range of international projects run by the university and consulting projects in Kazakhstan form city administration and government on local development.

Alena Kusá, PhD. Professor operates at the University of St. Cyril and Methodius in Trnava, Slovakia. She is a professor and guarantor for media and communication studies. Research and pedagogical activities are focused

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.