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Title: Characteristics and Actors of Impact Investing Ecosystem from the Perspective of Technology Startups

Year: 2023

Version: Published version

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Please cite the original version:

Okker, T., Auvinen, T. P., & Abrahamsson, P. (2023). Characteristics and Actors of Impact Investing Ecosystem from the Perspective of Technology Startups. In J. Melegati, A. Aldaej, L. Zaina, D. Petrik, H. Edison, & E. Guerra (Eds.), ICSOB-C 2022 International Conference on Software Business : Companion Proceedings (PhD Retreat, Posters and Industry Track) of the 13th International Conference on Software Business. RWTH Aachen. CEUR Workshop Proceedings, 3316. <https://ceur-ws.org/Vol-3316/industry-paper1.pdf>

Characteristics and Actors of Impact Investing Ecosystem from the Perspective of Technology Startups

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Abstract

Interest in impact investing within technology startup industry is increasing. Regardless of the growing interest in impact investing, there is a significant deficiency in research considering practice of impact investing in the field of technology. Also, technology startup perspective on impact investing ecosystem research is novel research stream which and the existing research on topic is very limited. Ecosystem paradigm is widely adopted in economics and management research and adopting it in impact investing research could increase the comprehension of the phenomenon. Again, it may result in better business decisions among startup company management and foster impact investments allocated to startup industry. This case study explores Finnish impact investing ecosystem emphasizing on technology startups and aims to fill the gap between the current practice and the academic research. Study was conducted as a multiple case study, and the main data acquisition method was a semi-structured interview. Case study includes in total of ten organizations operating in different roles within the Finnish impact ecosystem. The main contribution of this study is to describe and review the main characteristics and actors of the Finnish impact investing ecosystem. The study identifies in total of 22 impact investing ecosystem actors particularly for startup companies and amplifies previous views of the impact investing ecosystem research. Further, findings indicate that public sector organizations are prominent actors within Finnish impact investing ecosystem, and that there are variety of collaborating public and private actors in the ecosystem.

Keywords

Impact investing, ecosystem, technology startup, multiple-case study

1. Introduction

Impact investing is an investing method that integrates social and environmental impacts into financial return [9,18]. Despite the growing interest towards impact investing and impact investing ecosystem (IIE) research [11,1,10,29,17], there is a prominent shortage of information technology (IT) or technology related research as well as research considering the practical application of method in IT startups. Further, the existing research seldom covers the key elements and characteristics of IIEs, and objective analysis of method, markets as well as practical operations is meager [26].

For a long time, startup companies have been characteristic in IT business, and they drive innovations in several areas of societies [6]. Fertile connection between phenomenon and IT innovations is already perceived [26], but topic is not yet comprehensively covered within academic literature. Hence, there is an urgent need for research which examines and merges the key elements of impact investing with the IT startup environment. We suggest that the ecosystem paradigm could introduce answers to this phenomenon.

ICSOB' 22: 13th International Conference on Software Business, November 8–11, 2022, Bolzano, Italy

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CEUR Workshop Proceedings (CEUR-WS.org)

Business ecosystem research is a substantial research line to characterize the main operators and their relations within the defined economic environment [4] and the use of ecosystem analogy has increased since the early 2000's [27]. Existing ecosystem research has already covered several topics, and for instance interconnections and phases of the business ecosystem [27,4,5], performance indicators of business ecosystems [14], collaboration within the organization network [39], digital business ecosystems [31], management of innovation and technology [38], and characteristics of a startup ecosystems [24,25] have been discussed in prior literature.

The main contribution of this study is to narrow the gap in knowledge and provide future research streams for scholars by adopting current IIE and startup ecosystem paradigms to investigate the phenomenon. The study aims to define an IIE for impact startups by reviewing case organizations and main stakeholders related to ecosystem. Three RQ' were set based on initial research and to fill the gap in knowledge: what are the main characteristics of IIE from a technology startup perspective (1), what are the main actors within the IIE and how they cooperate (2), and what are the main stakeholders of startup companies within IIE (3). The structure of the paper is as follows: next section discusses on existing research and main characteristics, actors of IIE and current startup ecosystem research, and third section presents research methodology. Findings are presented in section four and paper's conclusions and discussion in the fifth section.

2. Impact investing ecosystem

IIE research origins from traditional business ecosystem research and it has increased substantially in recent years. Previously IIE has been studied in general [3,17], and from market [36] or regional centric perspectives [11,1,10,29]. Islam [17] proposes that IIE is one of the main research streams within the impact investing research and suggests three ecosystem related focus areas which are issues around the market growth, issues around the capital supply, and issues around investment readiness. In addition, established theory frameworks and methodologies such as network or actor-network based theories [22,38] and theory of change [18] have been applied and proposed to explain the impact investing paradigm. Number of studies emphasize the significance of identifying and reviewing the processes of main organizations and major stakeholders [22,36,2,3,17]. Features of roles and functions in the impact investing network appear to be a significant research narrative in the existing IIE research.

Another important undertone in IIE research has been the relevance of locality. There are significant regional differences between impact investing communities [29,17], which must be taken into consideration in IIE research. Impact investing has traditionally been adopted first and most successfully in European and North American markets [18], whereas there are evident barriers for impact investing growth in certain geographical areas [10,17]. Regional differences require more sophisticated studies in different cultural and legislation areas. Hence, further research on the differences of regional impact ecosystems is necessary.

Further, there are two noteworthy characteristics which are essentially present in IIE's. First, they are usually diverse and hybrid in form. Impact investing encompasses a great amount of diversity as investing targets and their sizes and maturity levels as well as scope varies greatly [15,13]. Also, the variety of actors is a characteristic feature of the business ecosystems [1]. Previous research suggests that IIE consists of several agents which share the same objectives of promoting environmental or social benefits alongside financial returns and are connected to each other in the network system. Second, IIE's also often construct several sub-ecosystems which resemble traditional entrepreneurial ecosystems [29].

Logical ecosystems usually consist of functional and interconnected operands. IIE is often depicted as a framework consisting of actors and domains in which actors operate. Several studies propose actor-network based theories or frameworks as an efficient paradigm to explicate business ecosystems [22,38]. Acevedo and Wu [1] have suggested a framework for IIE by merging the social impact investing framework and traditional entrepreneurial ecosystem framework. The proposed framework compounds the dual aspect of philanthropy and venture investment ecosystems, and it is based on the framework of entrepreneurial ecosystem by Isenberg and Onyemah [16]. The proposed IIE framework consists of six different domains and ten aspects connected to these domains. Domains incorporate several actors, interest groups and processes which together form an IIE [1.] One main characteristic of

IIE is the amount and variety of actors in the ecosystem. Several actors or actor types can be derived from the prior IIE research: companies, social projects, enterprises, governments, social enterprises, non-profit organizations (NPO), foundations, institutional investors, high net worth individuals and family offices, variable portfolio (VP) and stable value (SV) funds, research institutions, asset manager, incubators and accelerators, capacity builders, consults, financial institutions, and crowdfunding funds. [1,10.]

2.1. Startup ecosystem research

Startup ecosystems have recently been under investigation by many scholars and prior research includes several interesting research branches. IT and information systems (IS) discourses have been concerned in several existing ecosystem research [31]. Tsujimoto et al [38] regard digital ecosystems as a major branch in the field of the management of technology and innovation. Sussan and Asc [34] have proposed the Digital Entrepreneurial Ecosystem framework consisting of four concepts which are digital infrastructure governance, digital user citizenship, digital entrepreneurship, and digital marketplace. Sztangret [35] has studied organizational units fostering organizational operations in the business ecosystems, and Razavi et al [28] have characterized the transition to digital business ecosystems. Motoyama and Knowlton [24] have examined the structure of startup ecosystems by using the social network approach in their case study. Tripathi and others [37] have analyzed startup ecosystems in their multi-vocal literature review. Further there are several studies examining the regional perspectives of startup ecosystems [24,30,19,32] in the fields of business and entrepreneurship.

Several startup ecosystem definitions have been proposed. Tripathi et al [37] state that startup ecosystems are networks focusing on certain regional areas in which entrepreneurs and support organizations act to foster existing startups and create opportunities for new startups. Sipola et al [33] conceptualize startup ecosystem as a structure consisting of actors and agencies which is conditioned by contextual, temporal and renewal factors, emphasizing the differences between public and private actors.

Research on IIE and startup ecosystems has accelerated in the past few years. Several research centralizes on defining different types of actors and their relations. Also, characteristics of such ecosystems have been studied previously. Existing re-search often aims to describe and explain the functioning of rather limited ecosystems as ecosystem structures varies according to the geographical and cultural areas.

3. Methodology

This study is conducted as multiple-case study to increase comparability and generalizability of results. Single case study includes several limitations such as challenges in generalizability and several information-processing [12]. To reduce the effect of these limitations, a multiple-case approach, which is a study investigating a single phenomenon through several cases, can be used [20,21]. Multiple-case study incorporates several benefits related to the single case study approach. Multiple-case study approaches can increase external validity of the study, decrease research biases, and strengthen the overall confidence in findings [23]. When assessing the validity and reliability of the study, it must be noted that selected methodology and using of multiple case studies always include limitations due the limited number of informants and challenges in the efforts of generalizability.

In research design the research methodology was decided based on the initial review of the literature related topic. This research contributes to narrowing obvious gap between the research and the practice of IIE research of technology startups. Ecosystem research has roots in defining actors, stakeholders, and connections within specific networks of operation. Hence, it is appropriate to describe the main actors and processes of the IIE within appointed discourse and review the relation and the cooperation of actors. For clarity, abbreviation of IIE refers to IIE of Finnish technology startups.

3.1. Data acquisition and analysis

Main data acquisition method of this study is semi-structured interview. Total of twelve interviews of ten organizations were conducted during 2020-2022. Interviews were conducted with corresponding informants from case organizations. Secondary data acquisition method included information from organizations' public communication channels such as websites and reports. Unit of analysis in this study was IIE and interview questions were pointed to find out characteristics and actors within IIE. For case 2 and case 7 there were two informants, while for other cases there was one informant each. Informant titles varied from manager to CEO. Ten out of twelve interviews were conducted online using Zoom software, two interviews were conducted in the case organization's premises.

Interview data was transcribed after the interview and data coding was conducted using spreadsheets software. In coding phase relevant key words were identified and sentences including keywords were categorized into themes. Inductive thematic analysis was used to structure the data for further analysis. Structured interview's themes were basic information of organization and interviewee, description of impact investing, IIE actors and main stakeholders, challenges related to IIE, characteristics and processes of impact investing, impact targets and industry sectors, technology solutions, and prospects of the field. Thematic analysis was followed by an iterative data coding process which was conducted to identify interesting observations using thematic analysis, and finally observations were analyzed with other data acquired from case organizations and compounded as results.

3.2. Cases

It is important to determine and delimit the number of informants in the study to be able to keep the focus of the research [7]. We included a total of ten organizations (n=10) from Finland's impact investing markets to this case study. Organizations were selected using researchers' own knowledge of and case selection criteria applied a combination of strategies to expand variation and research convenience. Case organizations are presented in the Table 1.

Table 1
Case organizations

Organization type	Sector	Definition	Interview year	Title of informant and year
Financier	Public	Development fund	2020	Senior Investment Manager
Financier	Public	Finance organization investing private and public markets	2020	Bank Manager, Head of Private Banking
Accelerator, Consult, Financier	Private	Startup company providing consultation and finance	2020	Founder
Financier	Private	Finance organization offering private banking services	2021	Head of Impact Investing
Financier, Consult	Private	Investment company specialized in impact investments.	2021	Managing Partner
Software Startup	Private	E-health startup	2021	CEO
Business development organization	Public	Business development organization of the city of Jyväskylä.	2021	Project Manager, Project Planner
Software Startup, Consult, Business Accelerator	Private	Startup company providing strategy and business design services.	2022	CEO
Software Startup	Private	E-health startup	2022	CEO

4. Findings

This section covers finding of the study. We deliver the answers for the appointed RQ's in this chapter. To summary our key findings we provide Primary Empirical Conclusions (PECs).

4.1. Characteristics of the IIE

This section provides answers for RQ1. Total of nine characteristics were distinguished from the interview data. Characteristics and their frequency are presented in Table 2.

Table 2
Characteristics of the IIE

Characteristics	Frequency
Diversity in organization size and revenue	10
Emphasis on ecosystem structures	3
Hybrid nature of roles	3
Hybrid nature of sectors	3
Importance of public actors	6
Role of Social Impact Bonds	3
Strong emphasis on locality	3
Unestablished practices and processes	3
Utilization of sweat equity in development	1
Diversity in organization size and revenue	10

Scale of investment size and time horizon varies greatly in IIE. Established public investors such as pension funds and development financiers allocate hundreds of millions of euros to impact targets annually while individual investment can span from one million to tens of millions of euros. Time horizon is extending from one year to twenty years. Findings support existing research which indicates variety in size and maturity level of investing targets [15,13]. These observations apply both private and public financiers. Informant from development fund states: "Approximately 10 million per project could be about average. Our biggest ones are probably 25 million, and the smallest ones are around a million or less. Variation is quite extensive. We also look at the number of projects and want to keep the goals clear. We don't just make big ones; our owners want that we finance the small ones as well."

Results indicate that there is an emphasis on ecosystem structure within IIE. Ecosystem paradigm is especially discernible among public sector actors such as municipalities and business development organizations which have constituted officials for ecosystem establishment and development. Informant states: "We have a project of 170 million euros and ecosystem-centric way of working is at the very core of it. When private and public actors come together, coordination must be used, starting with the complete urban structure and planning, and then ending with the startup activity and its connection to this concept." Ecosystems are seen as corporation or partnership models which leverage emerging business opportunities and social and environmental impact. This finding supports existing IIE research results [1].

IIE actors operate in different roles which may overlap. We call this ensemble of distinct roles a hybrid nature of roles. For example, some actors contribute to the IIE in a role of investor, advisor, and business accelerator. Versatile roles enable agile operations and enhance cooperation between different actors but can also obscure the areas of responsibilities. Informant from private investment company stated: "We are different from many investors as we take an active role and do the work together with

the entrepreneurs. Sometimes we talk about being a part of the team and doing the work, but we also have a little more money than the normal team member.”

In addition to hybrid roles, actors have adopted hybrid nature of sectors. Current startup business models are often based on services which use application of technology rather than offering deep technology solutions. Thus, the role of technology and the service sector is ambulatory by nature. Investing decisions are based on desire to solve specific problems rather than sector specific investment allocations. Informant expressed the following: “I think it’s very old-fashioned to look at investments from an industry perspective, we look at the world for problems that should be improved and then look at companies that could fix them.”

There are two roles which applies to public actors such as development and impact funds, municipalities, and government organizations. They provide capital to domestic and foreign markets and act as a customer to impact startups' products and services as well as promote impact investing in ecosystems. Municipalities form pilot projects which offer significant opportunities to companies to scale their products and services.

Social impact bond (SIB) is a form of fund and a performance-based contract between government and private investors. SIB initiatives are more extensive than other impact investing ventures in terms of intended impact and financial resources. SIBs considered as a part of social impact investing by previous research [8]. The monetary value of a single SIB venture in Finnish IIE is usually from five to fifteen million euros and investing time horizon commonly spans from five to ten years. SIBs are especially a Nordic phenomenon and their prevalence in other cultural and geographical is meager.

Study reveals close connections between local startup sector, incubators, accelerators, business angel community, municipality, and local university. However, the impact on the IIE does not extend the local area of influence, more particularly the province borders. Targeted markets of companies are often local at first, and internationalization efforts come in the later phases of the life cycle. Regional limitations support the findings of prior research [29].

Legislation, processes, as well as cooperation between public sector and private sector within IIE is still immature and constantly in motion. Established processes, more effective management and common terminology are called by practitioners. Informant stated: “Challenge is that these models are still quite complicated. Buyers in the public sector still see these as really complicated and there are no common practices. Investment practices should be made more productized.”

Newly established businesses utilize sweat equity as a capital. Sweat equity refers to non-financial contributions by individuals. Sweat equity allows accession to ventures with a low threshold as no financial investment is required and hence it is one possible way for startup companies to gather intellectual capital among individuals who commit to shared impact targets.

- PEC1: Most important characteristics of IIE based on frequency are: (1) diversity in investment size and horizon, (2) importance of public actors.
- PEC2: Where several characteristics of IIE apply also to traditional startup ecosystems, characteristics of immense diversity of investment size and time horizon, significance of SIB’s, pronounced influence of public sector, and immature practices and processes are particularly relevant only to IIE.

4.2. Actors of IIE

This section provides answers for RQ2 and RQ3. We distinguish in total of 22 actors and eight actor types within IIE and identify main stakeholders of startup companies within IIE. Actors of IIE are depicted in Table 3.

Table 3
IIE actors

Actor	Actor type
Business Accelerator	Consultant
Business Advisor	Consultant

Business development organization	Consultant
Business incubator	Consultant
Company	Practitioner
Customer	Consumer
Educational Institution	Education
Government	Government
Investors and Advisors in Target Country	Investor, Consultant
Investment Company	Investor
Municipality	Government
Net Impact Service	Support
Non-governmental organization	Influencer, Support
Partner vendor	Practitioner
Pension fund	Investor
Private bank	Investor, Consultant
Individual investor	Investor
Portfolio manager	Investor, Consultant
Public investor	Investor
Public opinion	Influencer
Specialist	Practitioner
Support organization	Support

Consultant organizations support startup companies in forms of counseling, mentorship, training and aim to connect companies with investors and other main stakeholders. Consultants such as incubators and accelerators offer comprehensive scale of advisory services for companies within IIE concentrating on local startup companies and they support the collaboration between public and private sector organizations. Practitioners include companies, which provide services and products, partners, and specialists. Partner companies and vendors provide supplementary services or products and enable company operations in the markets. Specialists are employees or consultants which contribute to impact investing markets. Partner companies and vendors are also part of the business models for companies through shared platforms or joined venture models. Consumer is an actor type utilizing services or products developed by companies and is also involved in producing the service. Educational institutions are related to IIE in three ways. First, they provide experts to impact investing markets. Secondly, educational institutions advance the research of IIE and impact investing. Third, they collaborate with private companies and public organizations to build new products and services and collaborate in research projects. Informants mentioned that local educational institutions produce research data on which public startups build their solutions. Government affects to IIE through government policies and regulation, and via government organizations. In addition, government funding of municipalities and government organizations affect the number of public investments made to private sector companies. Municipalities provide finance and act as supervisors to actors, direct the focus and emphasis within IIE through management and finance allocation decisions and act as clients for projects and services for example through SIB ventures.

Generality of investment companies and private banks in Finnish IIE are domestic operators, but there are also local business development organization openings and programs for international investors. Investment companies and private banks can also operate in the role of business advisor and business consultant and manage open impact funds. Portfolio managers of private banking services and funds allocate financial resources to chosen companies and industries, thereby significantly affecting available funding in the IIE. Aside from private investment services, there several public organizations which can be categorized as public investors. Pension funds are prominent investors in public and private markets having a long tradition in sustainable investing, and recently their emphasis on impact themes has also increased. Addition to organizational investments, there are individuals who invest to impact initiatives by allocating straight finance, investing through impact funds, utilizing financial advisors. Finally, international investors and advisors in target countries are important global impact investing partners for the case organization. Support organizations provide supplementary services such

as net impact measuring services and promote impact investing practices. Public opinion influences attitudes towards impact investing and guides public and private sector organizations strategies. Non-governmental organizations (NGO) have influence on public opinion and local policies thereby shaping the operational landscape of IIE actors.

- PEC3: IIE comprises in total of 22 actors and eight actor types
- PEC4: Quantity of public actors disclose of the importance of the public sectors in IIE

Based on findings the main stakeholders of companies are customers, consultants including advisors, accelerators, incubators, and business development organizations, investors, and educational institutions. Specialists are evidently an essential stakeholder group as they are the main leverage for companies to build services and products. Investors and especially private investing companies and individual investors have close relationship with companies. Educational institutions provide specialists and collaborate with companies in ventures and research projects. In addition, government actors have direct impact on the success of companies within IIE by regulation and legislation. Municipalities collaborate with companies through pilot projects and in a role of customer, and business development organizations offer consultant services. Informant described the main stakeholders of IIE ecosystems as follows: “I think that in this ecosystem there are public actors, financial actors, and actual startups, and then this specialist market, which must be in a good balance. Higher education also seems to wake up.”

- PEC5: Main stakeholders of startup companies are customers, specialists, consultant actors, investors, educational institutions, and government actors

5. Discussion and conclusions

Study presents 9 characteristics and in total of 22 actors and eight actor types which contribute to IIE as well as main stakeholders of startup companies in the field. Most important characteristics of IIE are diversity of investment size and horizon, and importance of public actors (PEC1). We also distinguish four characteristics which are especially representative to IIE (PEC2). Study identifies several actors and proposes a novel categorization for actor types in the field (PEC3). Findings related to actors also indicate importance of public actors in IIE (PEC4). Finally, study discusses the main stakeholders of startup companies within IIE (PEC5). Results support existing research on characteristics of diversity in scale and revenue [15,13], emphasis on ecosystem structures [1], sub-systems [29], and in addition identified actors support the comprehension and partly adapts to domains and aspects proposed in the framework by Acevedo and Wu [1].

This study has several practical implications. Findings indicate that public sector has prominent influence on Finnish IIE, and hence we argue that public domain have a significant effect on whether IIE's and startup initiatives would prosper in Finland. Further, tendency of public incentives, legislation and acts could affect the velocity of green transition, social equality, and hence to viability of a startup sector. Impact investing is still minor phenomenon in Finland's financial markets and its visibility and significance is expected to increase significantly in the next few years. Since impact investing markets are likely to accelerate, companies, investors and other stakeholders may benefit significantly from their early adoption of the impact investing markets by comprehending main characteristics and actors of the IIE. Regarding the limitations of the study, we emphasize that study was conducted in Finland which is a welfare state possessing comprehensive social security benefits and relatively high gross domestic product. These notions need to be considered when drawing the general conclusion from the research and when comparing results to studies from other countries.

This study reviews Finnish IIE related to IT startups. The purpose of this study is to make existing ecosystem structures visible and to increase the understanding of the actors and stakeholders of the Finnish IIE by assessing three research questions: what the main characteristics of IIE from a technology startup perspective are (RQ1), what are the main actors within the IIE and how they cooperate (RQ2), and what are the main stakeholders of startup companies within IIE (RQ3). Study was conducted as multiple-case study including in total of ten case organizations. Contribution of this study

concerns main characteristics of IIE and review of the actors and their cooperation within IIE. Findings illustrate main characteristics and actors which are crucial for technology startups operating in IIE. Results of this study may aid practitioners to identify the main stakeholders and understand and provide several novel research avenues for scholars. For future research streams to explore, we propose the following topics which are still unclear or little researched: challenges within IIE, lifecycle models of IIE actors, startup co-operation within IIE's, impact-oriented startup business models, and challenges of impact measure and reporting in technology startups.

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