Author(s): Okker, Timo; Mohanani, Rahul; Auvinen, Tommi; Abrahamsson, Pekka

Title: Exploring the Finnish Impact Investing Ecosystem : Perspectives on Challenges from Technology Startups

Year: 2024

Version: Published version

Please cite the original version:

Okker, T., Mohanani, R., Auvinen, T., & Abrahamsson, P. (2024). Exploring the Finnish Impact Investing Ecosystem : Perspectives on Challenges from Technology Startups. In S. Hyrynsalmi, J. Münch, K. Smolander, & J. Melegati (Eds.), Software Business : 14th International Conference, ICSOB 2023, Lahti, Finland, November 27–29, 2023, Proceedings (pp. 299-314). Springer. Lecture Notes in Business Information Processing. https://doi.org/10.1007/978-3-031-53227-6_21

Exploring the Finnish Impact Investing Ecosystem: Perspectives on Challenges from Technology Startups

Timo Okker[1](✉), Rahul Mohanani[1], Tommi Auvinen[1], and Pekka Abrahamsson[2]

[1] University of Jyväskylä, Seminaarinkatu 15, 40014 Jyväskylä, Finland
falsetimookker@gmail.com, {rahul.p.mohanani, tommi.p.auvinen}@jyu.fi
[2] Tampere University, Kalevantie 3, 33100 Tampere, Finland
pekka.abrahamsson@tuni.fi

Abstract. The increasing significance of social and environmental impact within the technology startup business sector has garnered attention. Previous research has explored impact investing and related themes in the startup context. However, despite the growing interest in this area, a noticeable gap exists in research addressing impact investing ecosystems (IIE) and ecosystem-related challenges and advantages specifically within the technology field. This study endeavors to fill this gap by examining organizations within the Finnish IIE, bridging the divide between current industry practices and academic research. This study employed an interview-based approach, featuring thirteen interviewees representing eleven participating organizations. These interviews followed a semi-structured format, with all interviewees holding roles closely linked to the technology startup context within the Finnish IIE. Utilizing the thematic synthesis approach, this research aims to elucidate the perceived challenges faced by technology startups operating within the IIE. The findings of this study underscore the diversity and multiplicity of challenges confronting startups within the IIE, spanning various functions and operations, as well as the existing financial structures. Furthermore, this study puts forth recommendations for mitigating these perceived challenges and suggests potential avenues for future research within this domain.

Keywords: Impact investing · Impact investing ecosystem · Challenges · Software startup

1 Introduction

Impact investing has surged in popularity in recent years, garnering increasing attention from both practitioners and scholars as they explore opportunities to harmonize social and environmental progress with economic gains [1]. While impact investing has firmly established itself as a viable investment strategy across various industries, its integration into the realm of information technology (IT) remains notably underrepresented in

S. Hyrynsalmi et al. (Eds.): ICSOB 2023, LNBIP 500, pp. 299–314, 2024.
https://doi.org/10.1007/978-3-031-53227-6_21

2 information systems (IS) research [2]. The nexus between IT and impact investing has received limited scholarly attention, with only a handful of studies addressing this intersection [2–4]. Consequently, there remains a paucity of comprehensive research linking IT and the impact investing paradigm, as well as investigations into the practical implementation of impact investing within IT organizations.

Given that startup companies have been important innovation drivers within IT business for a long time [5], and the evident capacity of impact investing to contribute to environmental and societal challenges, it is imperative to delve deeper into the intersection of impact investing and IT startup research. Further, ecosystem research has become an important paradigm for both, impact investing and startup research. For instance, several studies have creditably described the characteristics of regional startup ecosystems and the barriers to ecosystem growth [6–8], and part of studies concentrate on IT and software startups [7, 9]. Despite this emphasis, there is a prominent shortage of research concerning advantages and disadvantages of technology startup ecosystems driven by the impact investing paradigm.

This study contributes to increase the knowledge by building up on existing impact investing ecosystem (IIE) research and empirical findings. This study defines IIE as a system which constitutes of separate interconnected actors operating in the same immediate environment. The study illustrates perceived challenges which retard the viability and evolution of IIEs to avoid known impediments of IIEs and foster processes and instruments in IT startups.

The data acquisition method employed in this investigation involved semi-structured interviews. The study encompasses a cohort of eleven informant organizations within the Finnish IIE, involving thirteen interviewees. The primary contribution of this study lies in the identification and description of challenges specific to technology startups operating within the Finnish IIE. Interestingly, several challenges resonate also to impediments perceived in the developing countries. As such, the study seeks to bridge extant bodies of knowledge pertaining to IIE theories and established startup ecosystem theories. This newfound knowledge has multifaceted utility, serving as a resource for informing novel impact initiatives, stimulating further research in this domain, and serving as a practical tool for averting common pitfalls in startup management. Study is multidisciplinary in nature by addressing research questions valuable for both IS and business study traditions. Moreover, given the nascent state of impact investing research within the fields of IS and IT, and the conspicuous dearth of understanding regarding its theoretical and practical applicability therein, this study contributes to narrowing this knowledge gap.

To address the overarching objectives of this paper, the following two research questions (RQ) were appointed: **RQ1**: *What are the most salient IIE-related challenges confronting technology startup enterprises*?; and **RQ2**: *How can these IIE challenges, specific to technology startups, be effectively mitigated*?

The paper is organized as follows: In Sect. 2, we explore the existing research related to IIE. Section 3 consolidates insights from previous studies, encompassing both challenges observed within IIE and those identified in the context of startup ecosystems. Section 3 provides an in-depth exploration of our chosen research methodology. Moving on to Sect. 4, we present the outcomes and findings of our study. In Sect. 5, we engage in a comprehensive discussion of the implications stemming from these results. Finally, Sect. 6 serves as the culmination of our paper, where we present our primary conclusions.

2 Background

2.1 Impact Investing Ecosystem

IIE research has its roots in traditional business ecosystem research and has witnessed significant growth in recent years. Previous studies have explored IIE from various perspectives, including a general overview [10, 11], market-centric viewpoints [12], and regional analyses [13–15]. Within the broader context of impact investing research, IIE has emerged as a prominent research stream, with prior studies identifying three primary areas of focus: market growth issues, capital supply concerns, and investment readiness matters. Established theoretical frameworks and methodologies, such as network or actor-network-based theories [16, 17] and the theory of change [18], have been proposed to elucidate the impact investing paradigm. Numerous studies underscore the importance of identifying and examining the processes of key organizations and major stakeholders [10, 16]. Based on the existing body of research, the roles and functions within the impact investing network emerge as a noteworthy research theme within IIE.

The entrepreneurial ecosystem approach has been introduced to investigate IIE as self-sustaining systems comprising distinct interacting components. This perspective underscores the significance of assessing the current ecosystem to enhance comprehension of critical attributes, including enabling actors, challenges, and opportunities. Additionally, it integrates the conventional entrepreneurial ecosystem approach with the established OECD Social Impact Investment Framework to formulate the IIE Framework. This proposed framework encompasses six core domains: policy, markets, human capital, culture, support, and finance. Furthermore, several supplementary aspects complement the primary domains within this novel framework [19].

Additionally, IIE research has underscored the significance of locality, given notable regional disparities among impact investing communities [11, 15]. These distinctions necessitate thorough consideration in IIE research. While impact investing has historically gained traction and proven most successful in European and North American markets [18], evident barriers impede its growth in specific geographical regions [11, 14]. These regional variations call for more nuanced investigations, tailored to diverse cultural and legislative contexts. Consequently, further research into regional differences within impact ecosystems is imperative. Although scholars have increasingly emphasized studies within their respective regions [13, 14, 19], there remains a need for additional research on regional aspects. Furthermore, cross-country research endeavors have aimed to uncover and comprehend regional nuances and disparities in IIE across diverse economic and cultural domains [13, 15].

2.2 Challenges in IIE

Previous research has identified five primary categories of challenges within IIEs: legal and regulatory compliance, positioning within modern investment portfolios, underdeveloped infrastructure, limited investment opportunities, and a shortage of human capital for impact strategy management [20].

A significant concern revolves around the ambiguity surrounding the term "impact investing". It lacks a universally accepted definition and is used inconsistently [21, 22], further compounded by divergent terminology employed by various IIE stakeholders due to their distinct professional backgrounds [23]. This discrepancy leads to communication issues where different practitioners may refer to different concepts when discussing impact investing.

Moreover, existing findings also highlight the formidable challenges associated with impact measurement and underscore issues related to transparency and credibility within impact funds [21]. Additionally, previous research underscores the burden on organizations to demonstrate social impact, coupled with a deficiency of tools for reporting impact outcomes [23]. Existing literature has identified numerous challenges and barriers that hinder the efficiency and impede the progress of IIEs. Disparities in the distribution of impact investing markets have resulted in certain regions being overshadowed within the global landscape. The absence of market enablers, notably government support, contributes to hindered and unequal opportunities in specific areas [11, 14]. Furthermore, the dearth of intermediary structures, coupled with high transaction costs and a deficiency in essential business skills [23], collectively serve as impediments for social enterprises.

The Ukrainian business community views impact investing primarily as a political and social endeavor, downplaying its commercial significance [14]. Interestingly, it has been observed that barriers, such as inadequate government support, impact the development of IIEs not only in developing nations with immature financial infrastructures but also in industrialized countries like Germany. The literature suggests that uncertain income models pose challenges to social enterprises due to discrepancies between their operations and inflexible public welfare funding, conflicts among various funding sources, and persistent market failures [23]. While traditional business ecosystems are typically perceived as self-sustaining systems [24], research findings underscore the essential role of public sector interventions in fostering the development and expansion of impact investing and IIEs [25, 26]. Consequently, the overall immaturity of the financial landscape and a lack of adequate public administration can be considered significant weaknesses for IIEs.

It's crucial to recognize that impact investing and its associated processes are in a constant state of evolution. Consequently, some of the challenges identified in prior research may have diminished in significance in the present landscape.

2.3 Startup Ecosystem Challenges

Existing research has identified a range of overarching challenges associated with startup businesses, encompassing financial constraints [27], shortages in human resources, deficient support mechanisms, and an inadequacy of conducive environmental factors [28]. Furthermore, another study specifically examined key challenges encountered during the early stages of startups, concluding that these challenges predominantly pertain to market dynamics, financial viability, team dynamics, and product development. It also emphasizes that in addition to the frequently cited risks related to market and finances, there are noteworthy concerns surrounding the motivation of project teams and the constraints imposed by limited time [29].

While the existing research primarily relies on case studies conducted within domestic startup ecosystems with distinct markets, the core challenges remain consistent. For instance, in the Hungarian startup ecosystem, significant challenges revolve around securing financing, penetrating the market, and addressing distribution channel limitations [8]. Similarly, an investigation into Iran's startup landscape highlights challenges related to financing, human resource management, and uncertainties encompassing the market, platform, and team dynamics [7]. In the Israeli software startup ecosystem, notable challenges include cultural disparities, time zone differences, language barriers, a technology-centric approach at the expense of marketing, a dearth of domestic markets, and an inexperienced workforce [6]. A study focused on the Indian startup ecosystem underscores impediments related to market entry, hiring qualified personnel, navigating a complex and bureaucratic regulatory environment, in addition to some region-specific challenges [30]. Albeit comparing the ecosystems from different regions is challenging, existing research reasonably accents important challenges which are characteristic for all startup ecosystems such as finance challenges, lack of human resources and market uncertainty.

3 Methodology

In terms of the epistemological paradigm, this study aligns with interpretive qualitative research. To enhance the relevance of the findings and to gain an in-depth understanding of the chosen phenomenon, we chose an interview-based research approach to answer our RQs [31].

3.1 Identifying Participants

In selecting organizations for this study, it was essential to maintain research focus [32]. We included eleven organizations within the IIE, comprising both technology startups and key stakeholders. Selection criteria were as follows: organizations needed to have a clear connection to impact investing, either as a practitioner or stakeholder, demonstrate transparent and recognizable operations, and exhibit visible impact investing activities.

Notably, this study did not restrict organizations based on their roles within the IIE. Instead, the selection aimed to encompass various organization types and stakeholders, such as startup companies, private and public investor organizations, government governance entities, and support organizations. These organizations mainly operate in Finland but may also engage in international impact investing markets or prioritize internationalization. The selection process involved researchers' knowledge of the market and direct contact with the chosen organizations. Further details about the case organizations can be found in Table 1.

Table 1. Informant organizations.

Organization	Role	Sector
Finnfund[1]	Financier	Public
Osuuspankki	Financier, Asset management	Private
Organization 3	Accelerator, Financier	Private
Organization 4	Financier, Asset management	Private
Organization 5	Financier, Consulting	Private
Organization 6	Startup	Private
Business Jyväskylä	Incubator	Public
Organization 8	Startup, Consulting	Private
Geego Kids Oy	Startup	Private
Wointi Oy	Startup	Private
FiBAN	Consulting	Private

3.2 Data Acquisition and Analysis

The data for this study was acquired through in-depth semi-structured interviews with individuals representing eleven different organizations within the Finnish IIE. A total of thirteen interviews were conducted between 2020 and 2022. Two informants were interviewed from informant organizations 2 and 7, while the remaining cases featured one informant each. The empirical data for this study partly originated from the interview data utilized in previous research [26]. Previously unanalyzed portions of these interviews were analyzed further in this study. The original interviews were conducted in Finnish language only. If the original questionnaire is request, readers are encouraged to contact the authors of this study.

To enhance the validity of the findings, interview transcripts were created immediately after each interview. An iterative coding process was used to identify noteworthy observations. Multiple codes were initially defined based on the interview data and subsequently refined into themes. Thematic analysis [33] was employed to structure the data, utilizing a thematic synthesis approach. Several themes of interest had already been identified during the semi-structured interviews, as they were designed to address specific predefined research questions. These predefined themes encompassed basic information about the organization and interviewee, descriptions of impact investing, IIE actors, challenges related to the IIE, characteristics and processes of impact investing, impact targets and industry sectors, technology solutions, and the prospects of the field itself.

[1] www.finnfund.fi/en/

4 Findings

This section presents our results by addressing the main research questions (RQs). Sub-Sects. 4.1 to 4.7 cover RQ1, focusing on the key challenges faced by technology startups in the IIE domain. Sub-Sect. 4.8 deals with RQ2. The results obtained from the analysis were categorized into themes based on the identified codes. A summary of the codes, themes, and example quotations can be found in Table 2 here. Each subsection below discusses the main themes emerged from our research.

4.1 Business Model Challenges

The findings identified challenges in developing impactful business models that deliver value to end-customers. Startups face difficulties in implementing production chains for their services or products. Additionally, they encounter challenges in the areas of design and marketing. To address these challenges, startups often require support in terms of business model development from organizations specializing in the implementation of impact-oriented business models and possessing substantial expertise in marketing.

4.2 Impact Evaluation Challenges

Challenges in Defining the Impact. The definition of the concept of impact investing remains incomplete and lacks precision. Notably, within the product chain, certain components may align with and positively contribute to impact targets, while others may distinctly conflict with these objectives. This raises a broader discussion on the fundamental nature of impact and the necessity for a comprehensive definition that spans a company's entire production chain and operational processes. This discussion aligns with previous studies that have identified and explored the challenges associated with defining and implementing impact investing, as supported by prior research [22–24].

Challenges in Measuring Real Impact. Measuring the true impact of operations is a complex task, primarily involving the identification and selection of metrics that warrant monitoring and assessment. It is not always evident which metrics align with the desired impact outcomes, adding an additional layer of complexity to the measurement process.

Interpreting impact data presents significant challenges for companies lacking the requisite expertise for data analysis. While impact data may be accessible, it often exists in a format that is not readily amenable to constructing meaningful metrics and information. Moreover, the measured data may not be effectively leveraged to enhance operational processes, primarily due to the inherent challenges in measurement.

Challenges in Reporting the Impact. The pursuit of transparency in impact reporting is a complex endeavor, characterized by its challenges. These challenges are particularly pronounced in ambiguous environments, such as countries with underdeveloped infrastructures. Paradoxically, regions with the greatest need for investments often coincide with environments presenting higher investment risks. Challenge was identified in the interview with Finnfund, a Finnish development financier and impact investor, which widely operates also in developing countries providing finance to local initiatives. Thus, perceived challenges in IIE spans over a larger geographical area than the Finnish markets.

The findings of this study reveal a deficiency in both understanding and resources within companies when it comes to reporting impact in alignment with stakeholder expectations. These findings align with existing literature on the subject [24]. It's important to note that the inability to provide accurate and comprehensive impact reporting poses significant business risks as stakeholders and investors may be reluctant to engage with companies that encounter challenges in their reporting efforts.

Dilution of Impact Investing. The term "impact investing" has shown signs of dilution due to its widespread and inconsistent usage. Within the IIE, actors often employ the term incorrectly, either intentionally or unintentionally. Some actors may intentionally misuse the term for marketing or management purposes. This misuse of impact investing terminology, without a comprehensive understanding, has the potential to dilute the term and presents a significant risk of "greenwashing."

4.3 Investment Challenges

Financial Infrastructure Challenges. Financial infrastructure challenges extend their impact across both domestic and international markets. Within the Finnish IIE, numerous public or partially public organizations engage in collaborations with international counterparts in foreign nations. However, disparities between regions and countries introduce significant impediments, given the substantial variations in jurisprudence, practices, and assumptions across these diverse contexts. These challenges can effectively deter investments made by Finnish investors to the markets of developing countries, as well as in companies operating within those regions.

On the domestic front, the financial infrastructure within the Finnish IIE faces a distinct challenge related to the availability of credible investment options for long-term product innovations. Consequently, a conundrum arises wherein traditional investors, primarily focused on startup companies, prioritize swifter growth and profit prospects over the extended developmental trajectories characteristic of such research-oriented projects.

Illiquidity of Investments. Impact investing instruments inherently possess complexity and illiquidity. These inherent characteristics render the determination of their value a challenging task, introducing a heightened level of risk compared to traditional investment instruments. Consequently, investors tend to shy away from impact investment products, thereby limiting the pool of available finance for such endeavors. These challenges associated with impact investing funds have been observed and documented in previous research [22].

Lack of Human Resources. Challenges arise in situations where startups face limitations in personnel availability to engage in the due diligence processes expected by public investors. Public investors typically necessitate a relatively comprehensive due diligence procedure before arriving at investment decisions. However, startup companies may find themselves lacking the necessary resources or capacity to adequately prepare for such processes or to effectively collaborate with potential investors.

Additionally, a broader issue lies in the overall scarcity of human resources within startup companies. Challenge is also appreciated by previous research [21]. Impact investors typically require extensive cooperation across various processes, including reporting. Startup companies often operate with relatively small teams whose roles may not be precisely defined, and individuals within the organization may be tasked with multiple responsibilities simultaneously. In such scenarios, establishing effective collaboration with investors proves to be a challenging endeavor.

Shortage of Finance. Several factors contribute to the constrained financial resources available to public sector organizations for investment in impact investing. First and foremost, many public sector entities, including municipalities and cities, grapple with budgetary deficits, creating substantial financing challenges. Secondly, the involvement of startup companies introduces a set of organizational risks that can dampen investor interest, particularly in the seed phase of startups.

Moreover, startup companies often represent relatively small-scale investment targets for traditional funds. Additionally, startup company shares tend to exhibit illiquidity, while the return on investment typically requires a longer timeframe compared to larger companies. These factors collectively render startup companies less appealing to traditional funds, leading to their exclusion from such investment vehicles.

Lastly, within the IIE, the absence of effective impact funds capable of providing financing to startup companies is a noteworthy concern. The interviewees highlighted the absence of impact investing funds in Finland during the interview period.

4.4 Legislation Challenges

Financial Regulation Challenges. Private investors encounter significant hurdles when attempting to enter the impact investing market. Impact investing instruments, notably funds, are categorized as complex and high-risk investment products, subjecting them to comprehensive financial regulations.

Stringent financial regulations place constraints on the potential investment volumes within the IIE. Presently, the creation of an investment product that could be accessible to private investors without professional investor status remains infeasible. Furthermore, the criteria for obtaining professional investor status are stringent and closely monitored by regulatory authorities. While this criterion serves to mitigate financial risks for individuals, it simultaneously restricts the pool of available funding. Additionally, entry into limited impact funds proves challenging due to the substantial minimum investment size requirements imposed.

Jurisprudence Challenges. Organizations hailing from diverse regions and cultural backgrounds often place distinct emphasis on varying legislative frameworks and case law, a phenomenon that does not always readily align or harmonize. These challenges, rooted in the divergence of legal and regulatory contexts, give rise to market risks that concern investors. Consequently, the presence of such risks diminishes the pool of potential impact-based funding available for projects in developing countries allocated by Finnish investors.

4.5 Market Challenges

Lack of Competence. The findings emphasize a significant knowledge gap among certain stakeholders within the IIE concerning their comprehension of profitable business processes and investment strategies, a trend that aligns with prior research [24]. These deficiencies in traditional investment practices exert an adverse influence on the quality of investment decisions and business strategies, thereby undermining opportunities for collaboration. This dearth of competence extends not only to the investment sector but also encompasses the available talent pool.

Furthermore, the findings illuminate a growing scarcity of specialized professionals and experts participating in innovative ventures within the software and technology startup sector. This insufficiency in human capital represents a substantial barrier to the expansion of startups operating within the IIE.

Non-marked Based Behavior. Non-market-based funding introduces additional barriers to entry for financiers who operate within market-oriented frameworks, especially within developing countries. Certain stakeholders within these markets do not align their operational and financial practices with prevailing market conditions. Such behavior introduces obstacles to the expansion of the impact investing market in developing countries by generating market anomalies and distorting the dynamics of local impact investing markets.

Furthermore, the presence of blended finance carries the potential to compromise the viability of traditional enterprises that might otherwise achieve higher profitability. Another challenge emerges when subsidized investments are predominantly directed towards relatively narrow sectors that are currently in vogue, thereby constraining growth opportunities in other potentially lucrative sectors.

Small Size of the Local Markets. Within the Finnish IIE, the limited scale of local markets and the complexity stemming from the multitude actors present challenges to ecosystem collaboration. Consequently, numerous stakeholders tend to allocate their resources towards international markets instead of nurturing local initiatives and stakeholder networks. Such behavior diminishes the vitality of the local IIE.

4.6 SIB Challenges

Social Impact Bonds (SIBs) represent investments in experimental social projects that yield a return upon the achievement of predefined impact targets [34].

Exiguity of SIB Investments. One perceived challenge related to SIBs pertains to fundraising for impact-oriented companies or projects. The current Finnish IIE leans more towards mission-oriented objectives rather than adhering to conventional investment practices. While mission-oriented ventures pursue impactful goals, they often translate into low-risk and low-profit investments. Consequently, they struggle to attract investors and fail to mobilize the required level of investment, resulting in an insufficient volume of SIB projects.

Extensive Size and Complexity of SIBs. SIBs typically entail a comprehensive and protracted process. According to interview data, the planning and metrics development phases of SIB projects can span several years. This extensive nature of SIBs poses challenges for many entities, including startups that typically operate with agile methodologies and rapid timelines. Previous research has characterized SIBs as complex [34]. The findings of this study underscore that the intricate governance structures and the costs associated with SIB projects render them infrequently used as a method for addressing social issues within public sector organizations. Consequently, this limits opportunities for startup companies to engage in collaborative endeavors.

4.7 Public Actor Challenges

Public and private actors within the IIE exhibit distinct management principles, posing challenges to effective collaboration. For example, startup companies operate with their own lexicon, practices, and operational frameworks, which differ significantly from those of governmental bodies and universities. Moreover, public sector organizations tend to avoid engagement with private sector brands, concentrating primarily on public administrative functions. This preference for pure public administration makes establishing efficient commercial partnerships challenging.

Public actors often lack expertise in marketing and branding of impact products and services, resulting in difficulties when coordinating these tasks in collaboration with startups. Public sector organizations often attempt to contribute to such tasks without the requisite proficiency, resulting in redundant efforts and hindrances to operations.

Competition for financial resources between public sector actors and private sector entities, such as registered associations, presents hurdles for private startups seeking financing. Existing entities may resist innovative solutions offered by private sector companies, thereby impeding the success of these companies.

Securing financing for private startups is further complicated by procurement processes that do not currently account for impact investing assets. Impact investing remains excluded from procurement specifications, and its distinctive characteristics are not factored into the process, resulting in the displacement of impact startups in procurement procedures.

Another challenge emerges from public investors' perception of impact companies as high-risk investment targets. This perception often leads to situations where financing for impact startups is either unavailable or comes at a higher cost compared to traditional companies.

4.8 Mitigation of Challenges

This section provides answers to RQs that pertain to practical implications derived from the results (RQ2). By presenting these implications, this study aims to contribute to the advancement of current research and furnish tools to assist practitioners within the IIE.

Create Impact Investing Funds. To enhance the funding of impact investing startups, a more targeted funding approach is imperative. Dedicated impact investing funds have the potential to effectively mobilize financing for startup initiatives characterized by relatively low risk profiles. Financial institutions and organizations should contemplate the establishment of such funds exclusively dedicated to the funding of impact investing companies.

Furthermore, impact investing funds play a vital role in reducing the barriers that individual investors face when entering the impact investing markets. These funds facilitate the participation of individual investors, as they do not necessitate professional investor status for those investing through them.

Enhance Collaboration Between Public and Private Actors. Given that numerous challenges within the IIE are intricately linked to collaboration between public entities and private enterprises, it is crucial to augment cooperation and the involvement of public organizations. The findings underscore that the root causes of several challenges stem from inadequacies in competence, misunderstandings, and feeble cooperation among various IIE stakeholders. These challenges, as revealed by the findings, are primarily attributed to shortcomings within public organizations.

Enhancing collaboration can be achieved through a series of strategic actions, and we propose the implementation of impact investing training specifically tailored for public actors engaged with companies focused on impact creation. This targeted training can help bridge the competency gap and foster more effective engagement between public organizations and impact-driven enterprises.

Define the Impact. Insufficient or unclear definition of impact relates to several challenges perceived by practitioners within IIE, and the issue was mentioned in several interviews. Impact targets are still constantly defined in ambiguous ways, which leads to challenges such as weak collaboration, lack of finance and tenuous impact results.

Challenges can be tackled by creating more accurate impact analysis when defining impact targets either by resourcing people to investigate impact within the company, or by acquiring this service as a purchased service from consultation companies specialized in impact evaluation. Results also highlight impact certificates to standardize the market.

5 Discussion

This study draws several key conclusions from its analysis. Firstly, it highlights that existing IIEs do not adequately facilitate cooperation between startup companies and investors. Public organizations, including business unit organizations and private consultants, should play a more active role in fostering networking and collaboration between investors and companies, allocating sufficient resources to support these efforts.

Secondly, the study identifies challenges stemming from public organizations' limited understanding of impact investing principles and processes, which hinders the development of necessary infrastructure for impact investing and support for startup companies within the industry. Third, the lack of a precise and universally accepted definition of impact investing creates issues for impact evaluation. To address this, the study proposes the implementation of certifications to clarify and standardize the definition of impact investing and encourages companies to allocate resources to create accurate impact analysis, while also calling for academic research to provide a more comprehensive understanding of the topic.

Furthermore, the study emphasizes significant obstacles in financing startups within the IIE. It reveals a disconnect between investors and investment targets within the ecosystem, underscoring the importance of fostering productive dialogue to address perceived uncertainties. Additionally, the study advocates for the evaluation of financial regulations to align them with the urgent needs of impact investing and the startup sector. The establishment of dedicated impact investing funds is also recommended to secure funding for innovative initiatives. Moreover, the study highlights the crucial role of public investments in securing financing for startups within the IIE.

Again, despite SIBs popularity in certain sectors, results of the study indicate that SIB projects are not able to leverage significant movement among technology startups as SIBs do not prove to be attractive from the startups perspective due several significant impediments related to them. At its current state SIBs apparently remain a minority form of investment notably among Finnish based technology startups.

This study aligns with prior research on IIE challenges related to legal compliance, impact definition and reporting, impact funds, human resources, competence, and SIB projects. While some challenges resonate with issues observed in startup management research, there are unique challenges specific to IIEs. Furthermore, several challenges resonate also to the markets of developing countries as Finnish IIE actors have connections to these countries in form of development finance. Additionally, this study contributes novel insights regarding impediments faced by technology startups within IIEs, enriching the body of knowledge in this field. While primarily rooted in the IS tradition, this research also holds multidisciplinary significance, offering theoretical and practical insights relevant to fields such as management and economic sciences.

5.1 Future research

Given that several perceived impediments in IIE are related to evaluation of impact and financial infrastructure and remain rather vague in existing research, this study emphasizes further research considering these topics. For instance, research on impact evaluation processes and practices among startup practitioners and well as studies considering the comprehension of impact concepts within startup companies would be pivotal. Furthermore, due the perceived shortcomings and challenges of current SIBs, they are not considered to be effective instruments to leverage financing for innovative impact initiatives. Hence, more research on SIB in the context of technology startups is encouraged. In addition, further research related to IIE's in IS in general is important to understand the phenomenon more profoundly.

5.2 Limitations

It is crucial to acknowledge that challenges within the IIE are both numerous and multifaceted, and any single study may not comprehensively address all perceived challenges. Therefore, it is imperative to conduct further research that focuses on specific types of challenges within the IIE.

In addition, it is worth noting that synthesizing the results of this study with the existing literature on the topic is not a straightforward task. Studies related to the IIE often have regional relevance, and their discussions are centered within specific contextual environments. While interviews provide valuable insights into delimited research subjects, their findings may not be directly generalizable.

6 Conclusions

In summary, this study endeavors to address the knowledge gap in IIE research and perceived challenges faced by technology and software startups and important stakeholders within these ecosystems. This study takes a multidisciplinary perspective to investigate perceived challenges and to provide practical implications to mitigate these challenges. The research employed a qualitative approach, utilizing semi-structured interviews for data collection. The study identifies multiple challenges encountered by various actors within the IIE, with many of these challenges remaining insufficiently addressed in previous research.

The findings of this study shed light on several challenges that are particularly salient for technology startups. Study identified multiple types of challenges within Finnish IIE which are as follows: business model challenges, impact evaluation challenges, investment challenges, legislation challenges, market challenges, SIB challenges and public actor challenges.

While issues related to impact evaluation, financing, and the availability of adequate human resources have already been recognized as challenges, this study contributes by highlighting additional challenges such as those related to business models, stakeholder dynamics, emerging market complexities, and issues specific to SIB projects. Furthermore, the study proposes three distinct perspectives for addressing the perceived challenges within the IIE, thereby enriching the body of knowledge in this field.

References

1. Agrawal, A., Hockerts, K.: Impact investing strategy: managing conflicts between impact investor and investee social enterprise. Sustainability **11**(15), 4117 (2019)
2. Okker, T.: Impact investing in information technology business. Electron. J. Bus. Ethics Organ. Stud. **27**(1), 16–28 (2022)
3. Jablonski, A., Jablonski, M.: Impact investing in digital business models. Energies **14**(18), 5785 (2021)
4. Gidron, B., Israel-Cohen, Y., Bar, K., Silberstein, D., Lustig, M., Kandel, D.: Impact tech startups: a conceptual framework, machine-learning-based methodology and future research directions. Sustainability **13**(18), 10048 (2021)
5. Baskerville, R., Ramesh, B., Levine, L., Pries-Heje, J., Slaughter, S.: Is internet-speed software development different? IEEE Softw. **20**(6), 70–77 (2003)
6. Kon, F., Cukier, D., Melo, C., Hazzan, O., Yuklea, H.: A panorama of the Israeli software startup ecosystem. https://ssrn.com/abstract=2441157. Accessed 27 Aug 2023
7. Salamzadeh, A., Kesim, H.K.: The enterprising communities and startup ecosystem in Iran. J. Enterprising Commun. People Places Global Econ. **11**(4), 456–479 (2017)
8. Jaki, E., Molnar, E., Kadar, B.: Characteristics and challenges of the Hungarian startup ecosystem. Budapest Manage. Rev. **50**(5), 2–12 (2019)

9. Tripathi, N., Seppänen, P., Boominathan, G., Oivo, M., Liukkunen, K.: Insights into startup ecosystems through exploration of multi-vocal literature. Inf. Softw. Technol. **105**, 56–77 (2019)
10. Alijani, S., Karyotis, C.: Coping with impact investing antagonistic objectives: a multistakeholder approach. Res. Int. Bus. Financ. **47**, 10–17 (2019)
11. Islam, S.: M: Impact investing in social sector organizations: a systematic review and research agenda. Account. Financ. **62**(1), 709–737 (2022)
12. Tekula, R., Andersen, K.: The role of government, nonprofit, and private facilitation of the impact investing marketplace. Public Perform. Manag. Rev. **42**(1), 142–161 (2019)
13. Acevedo, J., Wu, M.: A proposed framework to analyze the impact investing ecosystem in a cross-country perspective. Rev. Eur. Stud. **10**(4), 87–113 (2018)
14. Bukharina, L., Onyshchenko, O.: Development of the impact investing ecosystem in Ukraine. Investment Manage. Financ. Innovations **16**(3), 217–228 (2019)
15. Roundy, P.: Regional differences in impact investment: a theory of impact investing ecosystems. Soc. Responsib. J. **16**(4), 467–485 (2019)
16. Michelucci, F.: Social impact investments: does an alternative to the anglo-saxon paradigm exist? Voluntas **28**(6), 2683–2706 (2017)
17. Tsujimoto, M., Kajikawa, Y., Tomita, J., Matsumoto, Y.: A review of the ecosystem concept — towards coherent ecosystem design. Technol. Forecast Soc. Change **136**, 49–58 (2018)
18. Jackson, E.: Interrogating the theory of change: evaluating impact investing where it matters most. J. Sustain. Finance Investment **3**(2), 95–110 (2013)
19. Acevedo, J., Wu, M.: The impact investing ecosystem in Japan and Singapore. In: 24th International Scientific Conference on Economic and Social Development, pp. 120–148. Faculty of Management University of Warsaw, Warsaw (2017)
20. Ormiston, J., Charlton, K., Donald, M., Seymour, R.: Overcoming the challenges of impact investing: Insights from leading investors. J. Soc. Entrepreneurship **6**(3), 352–378 (2015)
21. Combs, K.: More than just a trend: the importance of impact investing. Corp. Financ. Rev. **18**(6), 12–18 (2014)
22. Höchstädter, A., Scheck, B.: What's in a name: an analysis of impact investing understandings by academics and practitioners. J. Bus. Ethics **132**(2), 449–475 (2015)
23. Glänzel, G., Scheuerle, T.: Social impact investing in Germany: current impediments from investors' and social entrepreneurs' perspectives. Int. J. Voluntary Nonprofit Organ. **27**(4), 1638–1668 (2016)
24. Peltoniemi, M.: Vuori, E: Business ecosystem as the new approach to complex adaptive business environments. Proc. eBusiness Res. Forum **2**(22), 267–281 (2004)
25. Mendell, M., Barbosa, E.: Impact investing: a preliminary analysis of emergent primary and secondary exchange platforms. J. Sustain. Financ. Investment **3**(2), 111–123 (2013)
26. Okker, T., Auvinen, T., Abrahamsson, P.: Characteristics and actors of impact investing ecosystem from the perspective of technology startups. In: ICSOB-C 2022 International Conference on Software Business: Companion Proceedings (PhD Retreat, Posters and Industry Track) of the 13th International Conference on Software Business, CEUR Workshop Proceedings, Bolzano, Italy (2023)
27. Colombo, M.G., Piva, E.: Strengths and weaknesses of academic startups: a conceptual model. IEEE Trans. Eng. Manage. **55**(1), 37–49 (2008)
28. Salamzadeh, A., Kesim, H.K.: Startup companies: life cycle and challenges. In: 4th International Conference on Employment, Education and Entrepreneurship (EEE), Belgrade, Serbia (2015)
29. Giardino, C., Bajwa, S.S., Wang, X., Abrahamsson, P.: Key Challenges in Early-Stage Software Startups. In: Lassenius, C., Dingsøyr, T., Paasivaara, M. (eds.) XP 2015. LNBIP, vol. 212, pp. 52–63. Springer, Cham (2015). https://doi.org/10.1007/978-3-319-18612-2_5

30. Korreck, S.: The Indian Startup Ecosystem: Drivers, Challenges, and Pillars of Support, vol. 210. ORF Occasional Paper (2019)
31. Klein, H.K., Myers, M.D.: A set of principles for conducting and evaluating interpretive field studies in information systems. MIS Q. **23**(1), 67–93 (1999)
32. Baxter, P., Jack, S.: Qualitative case study methodology: study design and implementation for novice researchers. Qual. Rep. **13**(4), 544–559 (2008)
33. Cruzes, D.S., Dyba, T.: Recommended steps for thematic synthesis in software engineering. In: 2011 International Symposium on Empirical Software Engineering and Measurement, pp. 275–284. IEEE
34. Warner, M.: Private finance for public goods: social impact bonds. J. Econ. Policy Reform **16**(4), 303–319 (2013)