Professional MBA
Entrepreneurship & Innovation

The role of start-up accelerators as a form of institutional support for early stage start-ups. Comparison study of US, Austrian and Polish experience.

A Master's Thesis submitted for the degree of
"Master of Business Administration"

supervised by
Prof. Dr. Sabine T. Köszegi

Tomasz Pilewicz, PhD

H1426311

Cristina Maria, MA

H1426310

Vienna, May 2016

Affidavit

I, **Tomasz Pilewicz**, hereby declare

1. that I am the sole author of the pages 5-8, 9-20 to 32-36, 46-53 of the present Master's Thesis, "The role of start-up accelerators as a form of institutional support for early stage start-ups. Comparison study of US, Austrian and Polish experience.", 76 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and

2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 27.05.2016

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Signature

I, **Cristina Maria**, hereby declare

1. that I am the sole author of the pages 21-31 to 37-46 of the present Master's Thesis, "The role of start-up accelerators as a form of institutional support for early stage start-ups. Comparison study of US, Austrian and Polish experience.", 76 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and

2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

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Signature

Preface

This master thesis is original, unpublished, and joint work by the authors, Tomasz Pilewicz, PhD and Cristina Maria, MA. International literature review performed within the thesis, was equal joint effort of the authors. Both authors in equal proportions contributed to formulation of Master Thesis problem, objectives, code of conduct, interpretation of empirical research results, discussion, recommendations, and further prospects. Empirical research in relation to start-up accelerators located in Austria has been performed by Cristina Maria, in Poland by Tomasz Pilewicz, and in the USA by both of the authors in equal proportions.

Our master thesis might have utilitarian value for European start-up accelerators' managing teams as variety of best practices, and case studies related to performance of start-up accelerators in USA is presented. We wrote this master thesis also to support start-up ecosystem stakeholders in creation of better environment for creation and performance of start-up accelerators, which are relatively new form of entrepreneurship support ecosystem. In our master thesis we particularly distinguish central, regional and local authorities, which can impact performance and effectiveness of start-up accelerators.

We applaud management of WU Executive Academy and Vienna University of Technology for organization of our residency in Boston, US, and Distinguished Guest Speakers Events within PMBA Entrepreneurship & Innovation 2014-2016 we had participated. These aspects of our study enabled us to understand complexity of subject, and deepen detailed aspects of our master thesis in particular.

Abstract

Main objectives of this master thesis are to identify best practices contributing to enhancement of performance of start-up accelerators in Europe and US, and to provide recommendations for start-up ecosystem stakeholders in creation of better environment for start-up accelerators creation, and functioning. Authors have decided on international literature review, electronic audit of official websites of start-up accelerators, mystery stakeholder method, and electronic surveys with start-up accelerators' managing teams. While European start-up accelerators basing on Austria and Poland are relatively new form of entrepreneurship support ecosystem, a set of best practices and recommendations for its stakeholders deriving from more mature model in USA can be indicated. Also start-up accelerators based in the US can derive from experience worked out by their European counterparts. In relation to countries investigated, it seems necessary to create instruments fostering start-up accelerators creation by public authorities, as well as to foster dissemination of the best practices between existing start-up accelerators. The originality of this master thesis lies in research of recent, international literature on the subject, and empirical research performed, resulting in variety of idiosyncratic, applicable conclusions for start-up ecosystem stakeholders.

Table of contents

Table of figures

List of tables

1. Introduction (Cristina Maria, Tomasz Pilewicz)

Sources of growth and socio-economic development factors are widely discussed in the context of economy of development, entrepreneurship, and innovation studies. In recent years particular focus has been placed on start-ups, which are temporary organizations designed to search for a repeatable, and scalable business model, but start their activity in conditions of extreme uncertainty[1]. Once the start-ups' offering finds commercial application an innovation in its understanding can be recognized. Therefore start-ups, and wider start-up ecosystem is widely discussed by central, regional, and local government in European Union[2].

Start-ups are recognized as potentially new sources of growth, through creation of new job positions, and participation in exchange of goods and services in economic value chains. In that context, we recognize the need for research identifying best practices contributing to enhancement of start-up environment in Europe through comparative studies between economies, which maturity of start-ups ecosystems differ. We purposefully selected USA, Austria and Poland as countries of our particular interest, and decided to investigate particular form of start-ups support, which are start-up accelerators we define further in detail.

USA is classified as the country of origin of start-up accelerators, and is recognized as one of the most competitive economies in the world, with developed innovation policy capacity and several globally-renowned local start-up ecosystems. On the other pole we set Poland, which is classified as moderate economy in terms of competitiveness and innovation policy capacity. Between poles created by USA and Poland we set Austria, which development and innovation policy capacity justify classification rather closer to USA, than to Poland. Nevertheless neither Austria, nor Poland have globally recognized local start-up ecosystems yet[3].

[1] Fuerlinger G., Fandl U., Funke T., The role of the state in the entrepreneurship ecosystem: insights from Germany, Triple Helix 2015, 2:3, p. 22.

[2] As in case in cross-European Union initiative "Start-Up Europe" with variety of support forms ranging from legal through financial and soft skills oriented for start-ups, https://ec.europa.eu/digital-single-market/en/startup-europe, accessed on 28th of March 2016, EU-Starting a business initiative focused on agile new venture creation in EU, http://europa.eu/youreurope/business/start-grow/start-ups/index_en.htm, accessed on 28th of March 2016, or

[3] Global Start-up Ecosystem Ranking 2015 listed top 20 start-up ecosystems taking into account the following criteria: performance on the funding and exit valuations of startups headquartered in ecosystem, quality of technical talent, its availability and costs, market reach relating to size of local ecosystem's GDP, and ease of reaching customers in international markets, having access to veteran start-up mentors/founders with previous start-up experience within the ecosystem, Global Start-up Ecosystem Ranking 2015, Compass 2015, p. 20.

Additionally, Austria and Poland do not belong to innovation leaders as per recent classification in European Union Innovation Scoreboard[4].

From that perspective the benchmark of positions in international social-economic rankings measuring economic development and innovation between USA, Austria, and Poland led us to conclusion that differences between creation and functioning of start-up accelerators in those countries might exist, and their identification and analysis might contribute not only to start-up accelerators operational improvements, but also to evidence-based policy making. Socio-economic differences and innovation-driven development between USA, Austria, and Poland underlying the background of our research have been presented in the table.

Table 1. Classification of USA, Austria and Poland in global economy competitiveness, and start-up ecosystem rankings.

Ranking	Ranking location of USA	Ranking location of Austria	Ranking location of Poland
The Global Competitiveness Index 2015-2016 (World Economic Forum, 2015) – Overall Index	3 (innovation-driven)	23 (innovation-driven)	41 (in transition between efficiency-driven, and innovation-driven)
The Global Competitiveness Index 2015-2016 - Innovation and Sophistication Factors Sub-Index (World Economic Forum, 2015)	4	14	40
Innovation Policy Capacity (Kaufmann Foundation, 2012)	Upper Tier	Upper-Tier	Lower-Mid Tier

[4] "(…) Austria is an innovation follower (…) Austria performs better than the EU average for most dimensions, except Economic effects and Finance and support, the latter because of poor relative performance in Venture capital investments (…) Poland is a moderate innovator (…) Poland is performing below the EU average for all dimensions, particularly for open, excellent and attractive research systems and linkages and entrepreneurship (…), Innovation Union Scoreboard 2015, European Union, 2015, p. 64-65.

Global Innovation Index (Cornell University, INSEAD, World Intellectual Property Organization, 2015)	5	18	46
Innovation Union Scoreboard (European Union, 2015)	Not applicable	Innovation Follower	Moderate Innovator
The Global Start-Up Ecosystem Ranking 2015 (Compass, 2015)	7 USA local ecosystems in the ranking within 20 ecosystems in ranking in total	No Austrian local ecosystems in the ranking within 20 ecosystems in ranking in total	No Polish local ecosystems in the ranking within 20 ecosystems in ranking in total

Source: Own elaboration basing on "The Global Competitiveness Report 2015-2016", World Economic Forum, 2015, p. XV, p. 7- 8, p. 38, "The Global Innovation Policy Index", Kauffman Foundation, 2012, p. 5, "The Global Innovation Index 2015, Cornell University, INSEAD, World Intellectual Property Organization", 2015, p. 17, "Innovation Union Scoreboard 2015", European Union, 2015, p. 64- 65., "The Global Start-Up Ecosystem Ranking 2015", Compass, 2015, p. 23.

Our master thesis gives particular attention to start-up accelerators, which in their modern, used in our work, definition had been created in last ten years, and whose approach is being widely adopted by private investors, corporations, and government bodies. Subject-matter literature indicates that whereas proliferation of start-up accelerators at global level and their worldwide population is estimated for thousands of programs in existence, the research on their role and efficacy is limited. Thanks to our research we plan to address identified gap, and provide possibly applicable conclusions and recommendations for managing teams of start-up accelerators and start-up ecosystem stakeholders, including public authorities in particular.

1.1 Problem formulation (Cristina Maria, Tomasz Pilewicz)

We formulated two problems we would like to approach in course of our research:

- Problem 1: Whether, and to what extent start-up accelerators in Austria, and Poland are using start-ups' oriented practices of start-up accelerators in USA?
- Problem 2: Whether, and to what extent public policy oriented on creation and performance of start-up accelerators in USA could be applied in Austria, and in Poland?
- Problem 3: Whether, and to what extent, start-up accelerators and public policy oriented on creation and performance of start-ups in USA could use the best practices of Austria and Poland?

We have formulated problem 1 with intention to discover possibly applicable practices for managing teams of start-up accelerators in Austria and Poland. Through explorative, multi-layer research, detailed in further part of our thesis, we aim to identify practices, including low-cost and information-based ones, that could contribute to Austrian and Polish start-up accelerators performance. We have formulated problem 2 with intention to came up with systematic, system-oriented conclusions for central, regional, and local policy makers, which activity toward start-up accelerators could support their creation and performance, possibly resulting in higher quality of their support toward start-ups. We find both problem 1 and problem 2 relevant in context of search for new growth and economic development sources, "Europe 2020" innovation-oriented development strategy, and "The Entrepreneurship 2020 Action Plan" fostering European entrepreneurship ecosystem[5]. Our intention is to identify idiosyncratic practices, which could contribute to better governance at start-up accelerators level, and also better external environment for their creation, and performance. We believe that results of our research will be beneficial for start-up accelerators managing teams, and for central, regional, and local public authorities, to whom nurturing entrepreneurship in evidence based way is not indifferent. In the next subchapter we present objectives of our research basing on the problems formulated.

[5] Europe 2020, http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_pl.htm, accessed on 28th of March 2016, The Entrepreneurship 2020 Action Plan. Reigniting the entrepreneurial spirit in Europe", Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Brussels, 9.1.2013m COM (2012) 795 final, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0795&from=ENm, accessed on 26th of March 2016, accessed on 26th of March 2016.

1.2. Objective of the thesis (Cristina Maria, Tomasz Pilewicz)

Basing on two problems identified and indicated above, we formulated specific objectives we will use in the research process of our master thesis:

- Objective 1: To identify, analyze, assess, and indicate best practices used by managing teams of USA-based start-up accelerators to start-up accelerator's teams based in Austria, and in Poland
- Objective 2: To identify, analyze, assess, and formulate possible directions of start-up ecosystem development deriving from USA for public authorities of central, regional, and local level in Austria, and in Poland.
- Objective 3: To identify, analyze, and assess the best practices of start-up accelerators and public policy oriented on creation and performance of start-ups in Austria and Poland, that could be applied in USA.

Basing on description of problems, and objectives formulated in the next subchapter, we present specific actions we undertook to approach them.

1.3. Method overview (Tomasz Pilewicz)

Our investigation was designed to enable us to approach problems and objectives we formulated. Our research process bases on three principle stages that are related to different source and research methods. We started our research from subject-matter literature review with intention to have modern literature reviewed, and analyzed. As start-up accelerators in the definition we use and explain in our thesis, started to exist after 2005, we purposefully focused most of our attention on the literature issued after that year. Due to the fact that start-up accelerators are relatively new phenomenon in economics, entrepreneurship, and management sciences, we also included analysis of relevant reports, rankings, and public policy acts.

The core of our research was conducted in the form of electronic audit technique, which is non-reactive scientific method with usage of structured questionnaire for analysis of content of website portals. In our research we analyzed official website portals of start-up accelerators. The rationale for electronic audit derives from transaction costs economics, and new institutional economy, which pay attention to information disclosed, information asymmetry,

and information costs. From that perspective information communicated through official website portals of start-up accelerators constitutes their attractiveness, and enables to classify itself as research material[6]. For electronic audit we designed structured questionnaire with set of 17 questions we have used to perform the audit of 30 start-up accelerators websites we selected. Data gathered in electronic audit questionnaire performed by us, due to unified content assessment methodology, enabled us to rank start-up accelerators, identify gaps and distinguishing practices used. Electronic audit has been deepened by electronic survey we designed and directly disseminated among managing teams of start-up accelerators. Survey questionnaire we designed consisted of 10 questions, which intention was to deepen our understating of aspects of start-up accelerators' performance, which could not be analyzed in non-reactive electronic audit method.

We focused both electronic audit and electronic questionnaire on organizational, and performance-related aspects of start-up accelerators in relation to internal mechanisms impacting possible success of supported start-ups, and external environment, which public authorities have impact on. Questionnaire of electronic audit together with electronic audit results, and also electronic survey can be found in the Appendix to our thesis.

On the research sample selection side we decided to research 30 start-up accelerators in total with quota of 10 start-up accelerators for each of countries we are describing (USA, Austria, Poland). The nature of our sampling in relation to USA part of sample was purposeful. We used one of reputable start-up accelerator's rankings to identify start-up accelerators perceived as role models, in relation to which we could expect identification of phenomena looked for[7]. In relation to Austria and Poland we identified that start-up accelerators are not as widely represented as in USA, and no reputable rankings classifying them exist. As a result we used web-context mining for identification and selection on start-up accelerators for our sample. Web-context mining referred in that context to usage of Internet search engine for research enquiry of "start-up accelerator", which results we checked against start-up accelerator definition criteria of S. G. Cohen, and Y.V. Hochberg we use in our thesis[8]. As a result we identified 10 star-up accelerators fulfilling that criteria, both for Austria, and for Poland. Within methodological design of our

[7] In relations to sample of start-up accelerators we used Solomon B , The Best Start-up Accelerators of 2015, Forbes Magazine http://www.forbes.com/sites/briansolomon/2015/03/17/the-best-startup-accelerators-of-2015-powering-a-tech-boom/#14c8226a34e4, accessed on 2nd of February 2016, and purposefully selected 10 first start-up accelerators.
[8] Cohen S.G., Hochberg Y.V, Accelerating Startups: The Seed Accelerator Phenomenon, op. cit. p. 10.

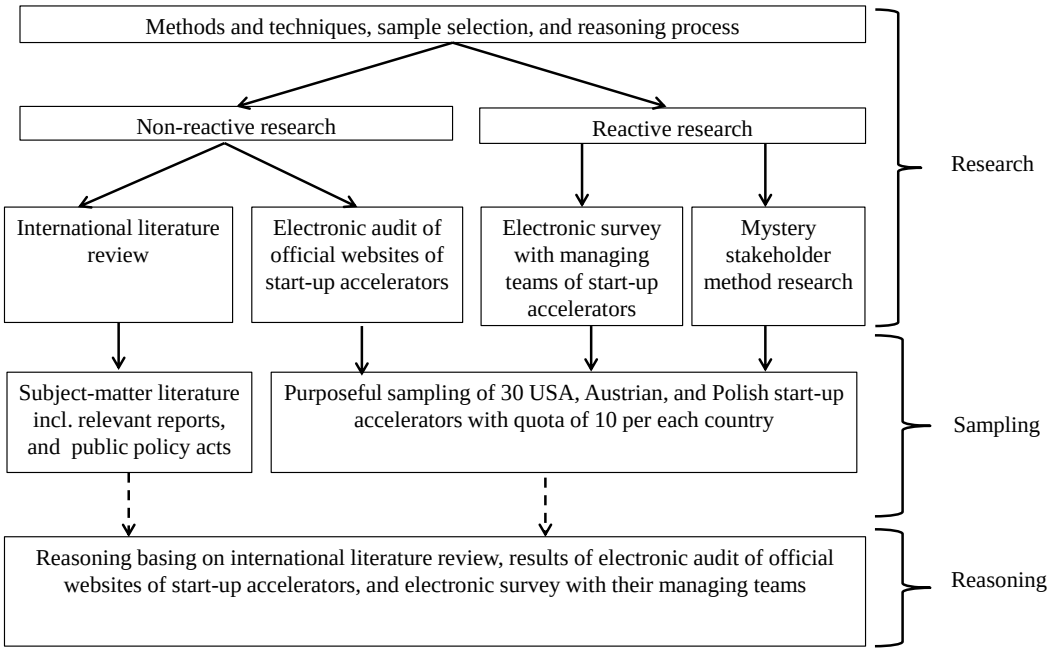
research we used research design literature with focus on economics and management context[9]. Our investigation in reference to particular research methods and techniques took place in the following terms:

- International literature review – 29.06.2015 – 28th of March 2016,
- Electronic audit of official start-up accelerators websites – 11th of January 2016 – 20th of February 2016 (30 electronic audits performed in total),
- Electronic survey with managing teams of start-up accelerators – 26th of March 2016 – 10th of April 2016 (>2< surveys collected in total),
- Mystery stakeholder survey with managing teams of start-up accelerators – 13th of April 2016 – 20th of April 2016.

Our research methods and techniques, sample selection, and reasoning method have been presented in the figure below.

[9] Apanowicz J., Metodologiczne uwarunkowania pracy naukowej. Prace doktorskie, prace habilitacyjne [*Methodological requirements of research work. Doctoral theses, habilitation theses*], Difin, Warszawa, 2005,. Forlicz S., Zastosowanie metod ilosciowych w ekonomii zarzadzaniu [*Usage of quantitative methods in economics and management*], CeDeWu, Warszawa 2012, Frankfort-Nachmias Ch., Metody badawcze w naukach społecznych [*Research methods in social sciences*], Wydawnictwo Zysk i S-ka, Poznan 2001, Aczel A.D. Statystyka w zarzadzaniu. Pelny wykład [*Statistics in management. Complete lecture*], Wydawnictwo Naukowe PWN, Warszawa, 2000.

Figure 1. Methods, and techniques, sample selection and reasoning process applied in our thesis.



Source: Own elaboration.

1.4 Structure of the thesis (Tomasz Pilewicz)

Our thesis consists of 5 chapters. In the introduction we present problem formulation, objectives of the thesis, method overview and course of our investigation. Chapter 2 provides review of international literature on start-up accelerators with particular focus on their definition, typology, and place among new forms of entrepreneurship support. Within that chapter we present start-up accelerators in view of contemporary economic theories, and also characterize entrepreneurship support ecosystem. Chapter 3 elaborates on the method we used in empirical studies of start-up accelerators in countries of our interest, including non-reactive, and reactive research methods, and also approach we used in coding of gathered empirical material. In chapter 4 we present results of empirical studies, characterize researched populations of start-up accelerators in Austria, Poland, and US, and indicate key similarities and differences among them. Chapter 5 concludes our thesis and includes discussion over results of literature review, and empirical studies, formulates recommendations in relation to thesis problems, and conclusion in relation to its objectives.

2. Start-up accelerators - theoretical background (Cristina Maria, Tomasz Pilewicz)

In chapter 5 we investigate start-up accelerators definitions, typology, and differentiation among other modern institutional forms of entrepreneurship support. The role of start-up accelerators is also analyzed in context of modern economics theories, such as transaction costs theory, and new institutional economics. Start-up accelerators are positioned among contemporarily identified dimensions of entrepreneurship ecosystems. Chapter concludes with place, and importance of start-up accelerators in entrepreneurship ecosystems establishing context for our further, empirical research.

2.1 Start-up accelerators – definition, typology, differentiation, and place among new forms of entrepreneurship's support (Tomasz Pilewicz)

Before beginning the discussion on start-up accelerators, it is important to clarify what is meant by start-ups. In our thesis we propose to define start-ups after S. Blank's proposal as *"temporary organizations designed to search for a repeatable and scalable business model"*[10]. According to S. Blank start-ups are designed to evolve into large companies, and he distinguishes two types of start-ups: the first type are early stage start-ups that are designed to search for a product and market fit under conditions of extreme uncertainty; the second type are late stage start-ups that are designed to search for a repeatable and scalable business model to scale up into large companies, which are designed to execute under conditions of high certainty[11]. Definition of start-ups is crucial for embedding start-up accelerators in their proper context, as start-up accelerators are not to focus on supporting other types of companies, incl. micro, small, and medium enterprises, but only the companies that fit the definition of a start-up[12].

While defining start-up accelerators we need to take into account the understanding of the word "accelerator" itself. British Dictionary defines accelerator as a device for increasing speed,

[10] Blank S., Search versus Execute, available at official website of S. Blank - http://steveblank.com/2012/03/05/search-versus-execute/, accessed on 25th of December 2015.

[11] Blank S., cited in Fuerlinger G., Fandl U., Funke T., The role of the state in the entrepreneurship ecosystem: insights from Germany, Triple Helix 2015, 2:3, p. 22.

12 For example start-up accelerator suppose not to focus on e.g. basic business services companies, highly niched or highly localized companies, or restaurants. These are not start-ups in the mentioned definition proposed by S. Blank, and as per general rule support of start-up accelerators is not designed for them, see also Hoffman D.L., Radojevich-Kelley N., Analysis of Accelerator Companies: An Exploratory Case Study of Their Programs, Processes, and Early Results, Small Business Institute Journal, 2012, Vol. 8, No. 2, p. 64.

which in context of physics refers to a *"machine for increasing the kinetic energy of subatomic particles or atomic nuclei and focusing them on a target",* in the context of chemistry it refers to *"a substance that increases the speed of a chemical reaction"*, and in the context of economics it is *"the relationship between the rate of change in output or sales and the consequent in the level of investment"*[13]. Scientific literature and research dedicated to start-up accelerators positions them as phenomenon relevant for entrepreneurship ecosystem. Phenomenon of start-up accelerators is relatively new. The vast majority of publications dedicated to their definition, characteristics, social and economic impact appeared in 21st century, which was directly related to creation of the first start-up accelerators and their global dissemination.

Y.V. Hochberg estimates that from the setup of the first start-up accelerator "Y Combinator" in the United States in 2005 the proliferation of start-up accelerators till 2015 resulted in approximately over 3000 start-up acceleration programs, active worldwide, in 2015[14]. Proliferation of start-up accelerators in the recent years resulted in academic discussion related to their definition, and characteristics distinguishing them from other, new institutional forms in the entrepreneurship support ecosystem[15].

Within the proliferation of start-up accelerators in the last 10 years (2005-2015) we can distinguish their early-stage and contemporary definitions. One of the early-stage definitions of start-up accelerators has been proposed in 2007 by B. Fishback, Ch. A. Gulbranson, R. E. Litan, L. Mitchell and M. Porzig, and was based on observations of first start-up accelerators in the United States such us "Y Combinator", or "Techstars". According to the mentioned authors, accelerators were groups of experienced business people who provide services, office space, management services, guidance, management expertise,

13Etymology of the word accelerator derives from Latin word "accelerates", which meant speeding up. Definition of accelerator in digital version of British Dictionary available online – http://dictionary.reference.com/browse/accelerator?s=t, accessed on 25th of December 2015.

14 Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, April 2015, article available at the official website of the National Bureau of Economic Research http://www.nber.org/chapters/c13584.pdf, p. 1, accessed on 25th of December 2015.

15 These new institutional forms in the entrepreneurship support ecosystem include start-up incubators, start-up schools, start-up weekends, start-up meetups, offices and co-working spaces for startups, hackathons, hackdays, or venture incubators, Miller P., Bound K., The Startup Factories, The rise of accelerator programs to support new technology ventures, NESTA, Discussion paper: June 2011, p. 12-13

assistance in business and product development, and networking to help the companies succeed in the early stages of venture life[16].In contemporary discourse start-up accelerators are defined more precisely and specifically. One of such definitions has been proposed by start-up accelerator's researchers, S.L. Cohen and Y.V. Hochberg. They understand start-up accelerators as *"fixed-term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event, often referred to as a >demo-day<"*[17] .

As start-up accelerators are a rather complex, and still evolving phenomenon, each element of above mentioned enumerative type of definition requires brief elaboration. Fixed-term nature of start-up accelerators refers to the timeframe when support for start-ups is delivered. It is usually from 6 to 12 weeks[18]. Cohort-based nature of start-up accelerators refers to enrolment of group with defined number of start-ups for fixed-term program. Cohort of start-ups accepted for the specific round of start-up accelerator's program is often called as a "batch", or a "class"[19].

Applying for support within start-up accelerator is involved with formal, usually several-step selection process[20]. Mentorship and educational components of start-up accelerators refer to intense exposition to start-up specific knowledge, and are considered as essential qualities delivered for participants in this form of entrepreneurship support[21].

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[16] Fishback B., Gulbranson Ch. A., Litan R.E., Mitchell L., Porzig M., Finding Business "Idols": A New Model to Accelerate Start-Ups, Ewig Marion Kauffman Foundation, 2007, p. 6-7.

[17] Hochberg Y.V, Accelerators and the Regional Supply of Venture Capital Investment, August, 2014, available at the official website of Social Science Research Network, http://ssrn.com/abstract=2518668, p. 6, accessed on 25th of December 2015.

18 In most of the start-up accelerators researched by S.G. Cohen and Y.V. Hochberg duration of start-up accelerators' programs was three months. S.G. Cohen and Y.V. Hochberg underline impact of established timeframes on engagement, and intense development of recruited start-ups - *"Established timelines and strict graduation dates reduce the amount of codependence between ventures and accelerators and force ventures to face the selection mechanisms that operate in the market."*, Cohen S.G., Hochberg Y.V, Accelerating Startups: The Seed Accelerator Phenomenon, March 2014, available at the official website of Social Science Research Network, http://ssrn.com/abstract=2418000, p. 10, accessed on 26th of December 2015.

[19] S.G. Cohen and Y.V. Hochberg argue that inviting defined cohorts by start-up accelerators to their limited-duration programs enable them to provide support in structured way, what impacts the overall efficiency of the programs, Cohen S.G., Hochberg Y.V, Accelerating Startups: The Seed Accelerator Phenomenon, op. cit., p. 10.

[20] Research of P. Miller and K. Bound proved that accelerator programs usually have web-based application processes through which all interested parties can apply without regard to their physical location. Paperwork within the application process is kept to a minimum, however, basing on the example of "Techstars" start-up accelerator, the applicants might be encouraged to include a video material, Miller P., Bound K., The Startup Factories, The rise of accelerator programs to support new technology ventures, op.cit., p. 9.

[21]According to D. L. Hoffman, and N. Radojevich-Kelley mentorship services within start-up acceleration program are intended to provide *"(...) access to successful entrepreneurs, mentors, and other technology experts, a place to socialize with other new venture founders, and a safe environment to share ideas or methods."*, P. Miller and K. Bound emphasize *that "co-working is a key part of the accelerator programme offer to founders"*, and that start-up

Public pitch event, or "demo day" is a public presentation of start-up value proposition, which exposes a start-up to potential investors, and finalizes start-up acceleration program[22]. After the public pitch event start-up accelerators open the recruitment of the next cohort, and next cycle of start-up accelerator program starts.

Many start-up accelerators provide a small seed capital to the start-ups accepted to the program, and receive an equity stake in the portfolio company in return. However this is not typical for all start-up accelerators fitting the formal definition proposed by S.G. Cohen and Y.V. Hochberg, and it is not *sine qua non* condition of start-up acceleration program. Seed capital in return for an equity stake are more typical of privately held start-up accelerators; whereas no seed capital investments, or seed capital investments without equity in exchange are more typical for not-for-profit, or public sector stimulated start-up accelerators[23].

Start-up accelerators are very often confused with start-up incubators, which at global level had appeared earlier than the former ones. However the differences between start-up accelerators and start-up incubators are significant, and can be indicated within the comparative analysis of S.G. Cohen and Y.V. Hochberg. While duration of start-up acceleration program is usually 3 months, the start-up incubator programs can last from 1 to 5 years. In terms of application process, start-up accelerators use cohort-based recruitment, whereas in start-up incubators application is continuously open. Start-up selection mechanism in start-up accelerators is competitive and of cyclical nature, whereas in start-up incubators it is noncompetitive, and of continuous nature.

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accelerators *"are not 'virtual' incubators, and face-to-face meetings and events between peers and mentors are essential"*, Hoffman D.L., Radojevich-Kelley N., Analysis of Accelerator Companies: An Exploratory Case Study of Their Programs, op. cit., p. 57, Miller P., Bound K., The Startup Factories, The rise of accelerator programs to support new technology ventures, op. cit. p. 10.

22 Demo-day is organized to enable graduating cohort of startup companies to present their businesses to a large group of potential investors and move from acceleration to market stage, Hochberg Y.V. , Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit., p. 1.

[23] Many accelerators that are privately owned contribute usually small amount of capital and take an equity stake in the ventures participating in the programs (e.g. "Y Combinator") Taking into account lack of ability of the accelerators to participate in follow-on rounds of start-ups financing raised by the start-up acceleration program graduates, the capital initially invested would be diluted by the time supported company reaches exit. As a result, some accelerators do not take equity stakes in the companies (e.g. "Mass Challenge" operated as non-government organization), Cohen S.G., Hochberg Y.V, Accelerating Startups: The Seed Accelerator Phenomenon, op. cit., p. 11, and Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit., p. 10.

Business model of start-up accelerators refers either to seed investments in nurtured start-ups, or not-for-profit support, whereas business model of start-up incubators is based either on charging rent from start-ups for space and services provided, or is also not for profit.

Taking into account maturity of start-ups supported, start-up accelerators focus on early stage ventures, whereas start-up incubators accept not only early-, but also later stage ventures, as per different, rent-based business model. Significant differences refer also to education and mentorship services provided. In start-up accelerators education is based on business-related seminars, and mentorship is intense; often delivered by external mentors. In start-up incubators education is based on ad hoc, non-formalized education initiatives, often referring to human resources, accounting, or legal services offered by the incubator, and the mentorship is of minimal and of rather tactical character. The last difference refers to the location of supported start-ups. In start-up accelerators the start-ups usually need not to be on site, as part of their intense development can have virtual character, and take place outside of the start-up accelerator; whereas in start-up incubators all start-ups that receive support need to be located on-site of the incubator.

Differences indicated will enable us to focus on the right new institutional phenomena in the entrepreneurship support ecosystem in the research part of the thesis. Above mentioned differences have been summarized in the table below.

Table 2. Differences between start-up accelerators and start-up incubators

Criterion	Start-up accelerators	Start-up incubators
Duration of support	3 months	1-5 years
Cohorts-based recruitment	Yes	No
Business model	Investment, or not-for-profit	Rent, or not-for-profit
Selection frequency	Competitive, cyclical	Noncompetitive, continuous
Venture stage of start-ups	Early	Early, or late
Education offered	Seminars	Ad hoc, HR, accounting, legal
Mentorship	Intense, by start-up and external mentors	Minimal, and tactical
Venture location	Usually on-site, but can be outside the start-up accelerator	On-site

Source: Own elaboration based on Susan G. Cohen, Yael V. Hochberg, Accelerating Startups: The Seed Accelerator Phenomenon, op. cit., p. 9.

During the last 10 years of start-up accelerators activity, researchers distinguished several types of them, basing on their investment focus, organizational form, or ownership criteria. D. C. Fehder and Y.V. Hochberg argue that many accelerators are generalistic with no specific industrial focus, however in the recent years some with specific industrial focus has been observed. Among the vertically-focused start-up accelerators, researchers distinguish start-up accelerators focused on healthcare and life sciences, which are represented by "StartX", "Rock Health", "Blueprint Health", "healthbox", or "New York Digital Health". Other contemporarily recognized vertically-focused start-up accelerators look for start-ups developing value proposal in hardware, or energy industry[24].

Another type of start-up accelerators are corporate accelerators, which also can be a form of internal entrepreneurship (also called intrapreneurship) stimulus, or an external factor contributing to corporation's growth. These are usually privately held start-up acceleration programs, run by international corporates such as Microsoft, or Telefonica, or by external providers of a service of running corporate start-up accelerator. Examples of the latter are "Disney Accelerator Powered by Techstars",or "Barclays Accelerator Powered by Techsters"[25].

Researchers distinguish also network start-up accelerators, whose business model is about franchising the accelerator's program to multiple locations. Having a network of start-up accelerators run by one operator can result in effects typical for economies of scale, economies of scope, network effects related to exposure to number of other start-ups, mentors, and potential investors, additionally supporting growth of start-ups within the program. An example of network start-up accelerator is "Techstars" with programs run in Austin, Berlin, Boston, Chicago, New York, Seattle, and San Antonio[26].

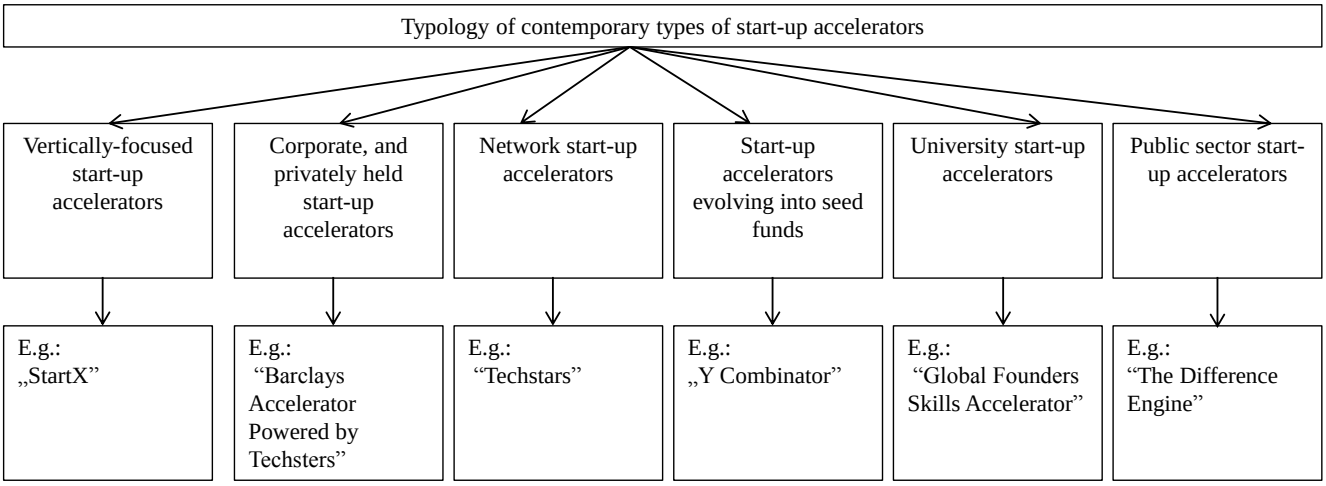
Some of the start-up accelerators are evolving into direction of seed funds, which are considered another, relatively new, separate type of start-up accelerators. An example of start-up accelerator that evolved into a seed fund, interested mainly in capital investments in return for equity and potential profits from start-ups finishing acceleration program, is "Y-Combinator".

[24] Fehder D. C., Hochberg Y.V., Accelerators and the Regional Supply of Venture Capital Investment, 2014, available at Social Science Research Network - http://ssrn.com/abstract=2518668, p. 6, and 31,accessed on 26th of December 2015, and Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, 2015, available at the official website of the National Beaureau of Economic Research, http://www.nber.org/chapters/c13584.pdf, p. 24, accessed on 26th of December 2015.
[25] Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit. p. 24.
[26] Ibid., p. 25.

Initially "Y-Combinator" represented typical fixed-term, and cohort-based acceleration program, whereas recently "Y Combinator" claim is to *"fund in start-ups in batches"*[27].

Another type of start-up accelerators are university accelerators. This kind of accelerators are affiliated with tertiary education institutions, and typically require start-ups to be affiliates of these institutions, such as students, employees, or graduates. Examples are "Global Founders Skills Accelerator" run at Massachusetts Institute of Technology, or "New Venture Challenge" run at University of Chicago[28]. The last type of start-up accelerators identified and analyzed within the subject matter literature are public sector start-up accelerators. These accelerators are sponsored by government programs. Such investments are justified by market inefficiencies and market failure in creation of new companies, which could contribute to particular locations' renewal and growth. An example of public sector start-up accelerator is "The Difference Engine" operated in the North East England in the United Kingdom, or "Betaspring" in Providence in the United States[29]. Above mentioned types of start-up accelerators have been summarized in the figure below.

Figure 2. Typology of contemporary types of start-up accelerators.



Source: Own elaboration based on Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit. p. 24-27, and Miller P., Bound K., The Startup Factories, The rise of accelerator programs to support new technology ventures, op. cit., p. 34.

[27] Ibid., p. 25-26.
[28] Ibid., p. 27.
[29] Miller P., Bound K., The Startup Factories, The rise of accelerator programmes to support new technology ventures, op. cit., p. 34.

As the phenomenon of start-up accelerators in their modern understanding is relatively new, their formal definition had also been evolving in recent years. Due to the investment's focus, and organizational form a typology of start-up accelerators can be proposed. In the next subchapter we will elaborate on the role and impact of start-up accelerators in selected modern economics schools providing broader context for their research.

2.2 Start-up accelerators in the transaction cost economics, and new institutional economics

(Tomasz Pilewicz)

In the context of economic sciences impact of start-up accelerators' activities can be analyzed within the transaction costs theory, also known as transaction costs economics, which is a modern economics school developed, among others, by O. E. Williamson, B. Klein, R.G. Crawford, and A. A. Alchian. Within the transaction costs economics transaction costs are costs incurred in making economic exchange, and they usually increase the total costs of transactions, and thus their attractiveness for exchange parties. Transaction costs within this theory include costs of search and information, which relate to determination of availability; costs of goods and services looked for; costs of negotiations of the contract, which relate to establishing acceptable agreement by exchange parties; and costs of contract enforcement, which relate to securing fulfillment of the terms of the contract by transaction parties[30].

[30] Availability of information of costs of goods, and services looked for by the parties of economic transaction is impacted by asymmetry, and imperfect nature of information available for both sides of the transaction. Such information disequilibrium impacts costs, and time needed to finalize a transaction, and might be equalized by on intermediary, which in context of our thesis is a start-up accelerator, Williamson O. E., Transaction-Cost Economics: The Governance of Contractual Relations, Journal of Law and Economics, Vol. 22, No. 2 (Oct., 1979), p. 233-261, available at the official website of College of Business at Illinois, https://business.illinois.edu/josephm/BA549_Fall%202010/Session%203/Williamson%20(1979).pdf, accessed on 27th of December 2015, and Williamson O.E., The Economics of Organization: The Transaction Cost Approach, American Journal of Sociology, Volume 87, Issue 3 (Nov., 1981), p. 548-577, available at the official website of Boston College, https://www2.bc.edu/~jonescq/mb851/Feb19/Williamson_AJS_1981.pdf, accessed on 27th of December 2015, and Klein B., Crawford R.G., Alchian A. A.,Vertical integration, appropriable rents, and the competitive contracting process, The Journal of Law and Economics, Vol. 21, October 1978, available at the official website of New York University, Leonard N. Stern School of Business, http://people.stern.nyu.edu/wgreene/entertainmentandmedia/vertint.pdf, p. 297-326, accessed on 27th of December 2015.

Implications of transaction costs theory relate to the factors, which impact on the intensity of economic exchange[31]. In context of transactions between start-up and investors, start-up accelerators can play a role of an intermediary between start-ups ready to be invested in and potential investors, and thus lower the transaction costs related to costs of search or due diligence resulting in stimulation of the economic exchange. In context of individual angel investors, seed capital, and venture capital firms searching for entities to invest in, certain aspects of transaction cost economics seem to be significant. Research of Y.V. Hochberg proves the impact of start-up accelerators on economic exchange: *"Accelerators, by design, likely lower the search costs for both entrepreneurs and investors seeking early stage investments.*"[32]. Remark made by P. Miller, and K. Bound in context of start-up accelerators in transaction cost economics is however more conservative to position of Y.V. Hochberg, but still indicates advantages for exchange parties: *"Venture capital firms (particularly outside Silicon Valley) are less likely to invest in startups at the point they emerge from accelerator programs, but they benefit eventually from a higher quality pipeline of ventures to invest in."*[33].

Impact of start-up accelerators on start-ups success measured by transactions made by them, after start-up accelerators graduation has been analyzed by D. L. Hoffman, and N. Radojevich-Kellay*: "Accelerator graduates have higher success rates compared to non-accelerator graduates as measured by longevity in business and receipt of further funding."*[34]. Direct impact of start-up accelerators on transactions between start-ups and their investors not only in context of transaction cost economics, but also real options theory, has been underlined by S.G. Cohen, and Y.V. Hochberg: *"Thus, the accelerator serves as a deal aggregator, and provides a real option for investors who learn about a batch of ventures before taking a larger financial stake in them"*[35]. J.-H. Kim and L. Wagman analyze the activity of start-up accelerators within the transaction costs economics, but also a game theory model of the accelerator as certification institution of start-up quality.

[31] Leonard J., Transaction Cost Economics [in:] Wilkinson T. J. (eds.), Strategic Management in the 21st Century. Volume I: The Operational Environment, ABC-Clio, 2013, p. 66 – 82.
[32] Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit. p. 16.
[33] Miller P., Bound K., The Startup Factories, The rise of accelerator programmes to support new technology ventures, op. cit., p. 11.
[34] Hoffman D.L., Radojevich-Kelley N., Analysis of Accelerator Companies: An Exploratory Case Study of Their Programs, Processes, and Early Results, op. cit., p. 67.
[35] Cohen S.G., Hochberg Y.V., Accelerating Startups: The Seed Accelerator Phenomenon, op. cit., p. 14.

According to J-H. Kim and L. Wagman certification process of start-up accelerators is important to financial market stakeholders. Start-ups graduating from highly selective, fixed-term, and cohort-based acceleration program, are proved by start-up accelerator as ventures representing distinguishing qualities among the pool of all early stage start-ups available at the market to invest in. Therefore graduation from start-up accelerator might constitute a quality related information looked by potential investors, and lower their search and information related costs[36].

Start-up accelerators' certification effect, and their start-ups validation role can be exemplified in the example of private investors - Y. Milner and R. Conway, who in 2011 *"(..)made a blanket offer to invest $150,000 in every single startup in the most recent batch from the Y Combinator accelerator program (...)"*[37]. Although the impact of start-up accelerators on financial market institutions and economy exchange needs further research, their potential impact on different start-up stakeholders has been indicated by K. Miller and K. Bound. Our own elaboration on these benefits has been presented in the table below.

Table 3. Stakeholders benefiting from start-up acceleration programs.

Stakeholder	Type of benefit
Angel investors	• Reduction of costs and time required to find new start-ups to work with, • Reduction of need for investment due diligence, as it is performed by start-up accelerator, • Ability to meet other investors and start-up founders.
Venture capital firms	• Reduction of costs and time required to find new start-ups to work with, • Improvement of deal pipeline, and creation of more high quality start-ups, • Access to new technology, and ability to map trends in start-ups, • Ability to meet other investors, and start-up founders.

[36] J.-H. Kim and L. Wagman also make also a remark on potentially negative side of start-up accelerators' certification process relating to a game theory model: "*We then showed that there is another potential source of inefficiency in the accelerator's certification process. The accelerator may only reveal favorable signals about portfolio ventures to maximize its profits. This is because only when its portfolio firms raise subsequent funding does the accelerator stand to gain from its ownership stakes."*, Kim J-H., Wagman L., Portfolio Size and Information Disclosure: An Analysis of Startup Accelerators, Journal of Corporate Finance, Vol. 29, December 2014, available at the official website of Social Science Research Network, http://ssrn.com/abstract=2142262, p. 3-24, accessed on 27th of December 2015.

[37] Miller P., Bound K., The Startup Factories, The rise of accelerator programmes to support new technology ventures, op. cit., p. 7.

Large technology firms	• Ability of talent sourcing for new employees, • Ability of acquisition of new customers for own platforms and services, • Ability to co-brand with a start-up, and to support start-up's business.
Other start-up founders	• Ability of talent sourcing for new employees, • Ability of creation of high quality business network, • Ability of meeting customers and later-stage investors that might be relevant to start-up business.
Service providers (e.g. accountancy firms, law firms, PR firms)	• Ability to meet new customers in the form of start-ups supported by accelerator.

Source: Own elaboration based on Miller P., Bound K., The Startup Factories, The rise of accelerator programmes to support new technology ventures, op. cit., p. 12.

Above analysis of benefits and advantages created by start-up accelerators for their stakeholders proves impact on market stimulation and potential transactions. In context of justified activities of start-up accelerators as transactions stimuli, it might indicate on high transaction costs, and therefore certain market failure and market inefficiencies in self-regulation of transactions between start-ups and financial market stakeholders. From that point of view start-up accelerators are phenomena of interest of new institutional economics, which is a modern economics school that focuses on the impact of institutional environment on transactions, including the transaction costs developed, among others, by D. C. North and R. H. Coase.

New institutional economics is a school, which indicates the role of policy making process, public sector institutions, legal, and cultural systems on economic development. D. C. North defines institutions in economics' context not only as formal rules, including constitutions, laws, and property rights, but also informal constraints impacting economic exchange, such as sanctions, customs, traditions, or cultural taboos [38]. New institutional economics extends the perspective of economics on institutions enumerated by D.C. North, and underlines that economic activity is impacted by institutions existing prior to circumstances, and context of parties interested in economic exchange. It also opens a research ground for comparative institutional analysis focused on comparison on defined institutional aspects impacting potential transactions to formulate concrete recommendations,

[38] North D.C., Institutions, Journal of Economic Perspectives, 5(1), 1991, p. 97 - 112.

and actions for economy improvement[39]. In that context, new institutional economics examines the role of institutions in nurturing or preventing economic growth. In the field of our thesis, narrowly understood institutions (such as policy making process, legal system, and public sector institutions) might have impact on both proliferation of start-up accelerators in economies, and decrease of market failure and market inefficiencies related to costs of transactions between start-ups and their potential investors. Potential results for the economy resulting from engagement of institutions relevant for entrepreneurship ecosystem might result in growth of entrepreneurship, creation of start-ups, and general attractiveness of start-ups as investment opportunities for the investors.

New institutional economics provide additional context for creation of start-up accelerators by public sector institutions, what had been analyzed by start-up accelerator's researchers. Ch. W. Wassner argues, that: *"Public administrations counsel, assist, and promote entrepreneurs. Above all, they take into consideration the special features of their locality. Furthermore, public capital accumulation and access to public capital are important factors which contribute to variations in regional economic structures."*[40]. Start-up accelerators with engagement of public sector had been created in the United Kingdom, or in the United States *"in areas with a lower concentration of investment and potential mentors"* [41]. The biggest engagement of public sector in creation of start-up accelerators so far had probably been undertaken by the government of Chile in form of "Start-up Chile" program.

Start-up Chile program had been launched in 2010. The program is run by Chilean Ministry of Economy and Chilean Economic Development Agency (CORFO), which is an organization responsible for country's economy promotion. Participants of the program are offered free office space in downtown of Santiago, mentoring services by program staff and external mentors, and also USD 40 000 equity-free seed capital, 50% of which is delivered at beginning of the program, and 50% after 3 months,

[39] Coase R. H., The Problem of Social Cost, Journal of Law and Economics, Vol. 3, October 1960, p. 1-44, available at the official website of digital library of academic journals, books, and primary sources JSTOR http://www.jstor.org/stable/724810 , accessed on 27th of December 2015, and North D, Institutions, Institutional Change and Economic Performance, Cambridge: Cambridge University Press, 1990.

[40] Wassner Ch. W., Entrepreneurship and the innovation ecosystem policy lessons from the United States, in: Audretsch D., Grimm H., Wessner Ch. W., Local Heroes in the Global Village. Globalization and the New Entrepreneurship Policies, Springer Science+Business Media, Inc., New York, 2005 , p. 149.

[41] The Difference Engine start-up accelerator in North East England in the United Kingdom, and Betaspring start-up accelerator in Providence in the United States, Miller P., Bound K., The Startup Factories, The rise of accelerator programmes to support new technology ventures, op. cit., p. 34.

after reaching milestones agreed by the start-up. Program aims to attract foreign entrepreneurs, as it provides work visas, local identity card, and support in securing housing. Foreign participants of the program are paired with "buddies" from Santiago business community. Each participant of the program has to contribute in building entrepreneurial culture in Chile, as the participants have to accumulate certain amount of "Return Value Agenda" points that, as artificial currency, are used for paying for their social contributions expected in return for given support[42]. Start-up Chile can be perceived as a specific program aiming at local market failures and inefficiencies, as the Chilean government can be perceived as start-ups investor expecting return not in financial, but rather cultural change toward entrepreneurial attitude of the nation. Founder of the program, N. Shea, argues that the objectives of Start-up Chile were to attract talent, to inspire Chileans to become entrepreneurs, and start an internal mentality revolution[43].

Analysis of the start-up accelerators from the point of view of modern economics schools such as transaction costs economy, or new institutional economics provides additional research angle, and arguments for deepening their operations model, and dissemination of possibilities in context of the new institutional forms of entrepreneurship support, which is the topic of further parts of our thesis.

2.3 Entrepreneurship ecosystems - definition, typology, differentiation, and place among entrepreneurship ecosystem dimensions (Cristina Maria)

According to Oxford Official English Dictionary, an ecosystem is *"(...) biological community of interacting organisms and their physical environment - >the marine ecosystem of the northern Gulf had suffered irreparable damage<; (...) a complex network or interconnected system >Silicon Valley's< entrepreneurial ecosystem"*[44].

Translating the latter definition into the business world, an entrepreneurial ecosystem would be a complex network or an interconnected system of business environment institutions, entrepreneurs, small, medium, and big companies, and interactions taking place between them.

[42] Gonzalez-Uribe J, Leatherbee M., Business Accelerators: Evidence from Start-Up Chile, March 2015, available at the official website of the London School of Economics and Political Science, http://www.lse.ac.uk/fmg/events/SUP-Gonzalez-Uribe-Leatherbee-13032015.pdf, p. 1-27, accessed on 27th of December 2015.
[43] Ibid., p. 25.
[44] Definition of ecosystem in Oxford Official English Dictionary, http://www.oxforddictionaries.com/definition/english/ecosystem, accessed on 26th of March 2016.

The link between the biological meaning and the business meaning of ecosystem is provided, among others, by M. Rothchild in "Bionomics: Economy as Business Ecosystem". Having Darwin's evolutional theory as a starting point, author connects interdependencies between the process of evolution of biological reign and the innovation driving forward the humanity through business. M. Rothchild also constructs a parallel between the organism and the organization outlining similarities from a simple business like a pastry and a single cell organism, underlying the use of resources, tools and processes to ensure survival and output[45].

Another source – Investopedia defines business ecosystem as "(…) *network of organizations – including suppliers, distributors, customers, competitors, government agencies and so on – involved in the delivery of a specific product or service through both competition and cooperation. The idea is that each business in the >ecosystem< affects and is affected by the others, creating a constantly evolving relationship in which each business must be flexible and adaptable in order to survive, as in a biological ecosystem."* [46] Similar to its biological counterpart there are collaboration relations, competitive relations, and tolerance relations between the members of the entrepreneurship ecosystem. The similarities go even further as there is a competition for limited resources same as in the wild life, there are critical alliances that allow survival, or lead to perish, and there is a geographically delimited environment where interactions takes place.

Entrepreneurship ecosystem in its modern meaning has been proposed, among others, by D. Isenberg, founder of Babson Global's New Entrepreneurship Ecosystem Project. D. Isenberg defines entrepreneurship ecosystem as *"(…) set of networked institutions (…) with the objective of aiding the entrepreneur to go through all the stages of the process of new venture development. It can be understood as a service network, where the entrepreneur is the focus of action and the measure of success"*[47].

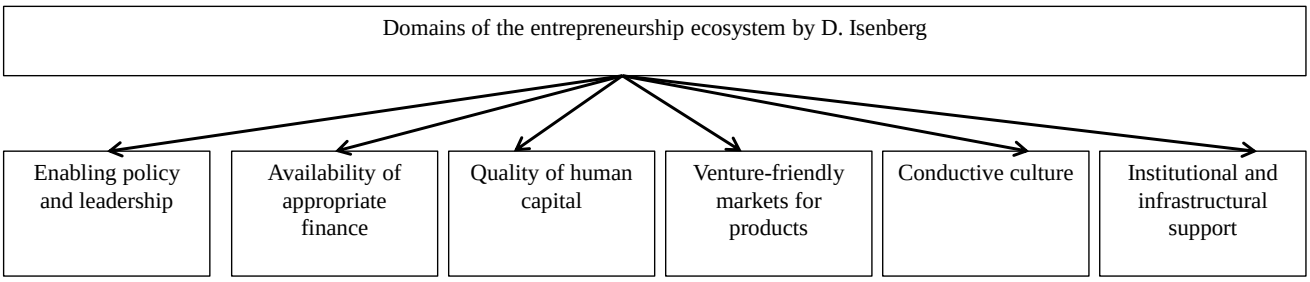
According to D. Isenberg an entrepreneurship ecosystem consists of institutions of six following domains:

- Conductive culture,
- Enabling policies and leadership,

[45] Rothchild M., Bionomics: Economy as Business Ecosystem, Beard Books, Washington 2004, p. 64-71, p. 80-107.
[46] Definition of business ecosystem in Investopedia, http://www.investopedia.com/terms/b/business-ecosystem.asp, accessed on 26th of March 2016.
[47] D. Isenberg, cited in Fuerlinger G., Fandl U., Funke T., The role of the state in the entrepreneurship ecosystem: insights from Germany, , op. cit., p. 6.

- Availability of appropriate finance,
- Quality of human capital,
- Venture-friendly markets for products,
- Range of institutional and infrastructural supports.'

Figure 3. Six domains model of entrepreneurship ecosystem of D. Isenberg, 2011.



Source: Own elaboration basing on Domains of the Entrepreneurship Ecosystem, Babson Global, http://blogs-images.forbes.com/danisenberg/files/2011/05/EES-Domains-and-Pillars-only1.jpg, accessed on 26th of March 2016.

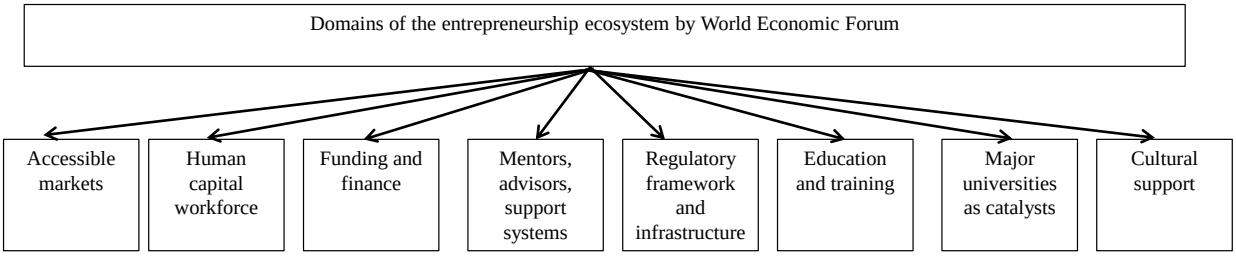
Following the six domains of entrepreneurship ecosystem by D. Isenberg from 2011, an empirical study contributing to work of D. Isenberg had been conducted by the World Economic Forum and its partners in 2013. Research of World Economic Forum reached to thousands of entrepreneurs around the globe, who elaborated on differences between entrepreneurial ecosystems around the globe in terms of availability of particular domains that construct an ecosystem, and also importance of these domains for growth and commercial success of their companies[48].

As a result of World Economic Forum research six domains proposed by D. Isenberg has been complemented. Research revealed importance of education and culture in context of catalytic factors in functioning of the ecosystem. The aspect of education referred to mentorship programs, trainings, and university involvement in fueling start-up communities with high quality human capital, and creating spaces for creativity and entrepreneurial initiatives.

[48] Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics, World Economic Forum, http://www3.weforum.org/docs/WEF_EntrepreneurialEcosystems_Report_2013.pdf, p. 6-7, accessed on 7th of January 2016.

Indicated aspect of education and intense mentoring outlined by the research is also a premise of start-up accelerator defined in earlier part of the thesis. Based on World Economic Forum research, the entrepreneurship ecosystem has been broaden by additional domains, and we present it below.

Figure 4. Eight domains model of the entrepreneurship ecosystem by World Economic Forum, 2013.



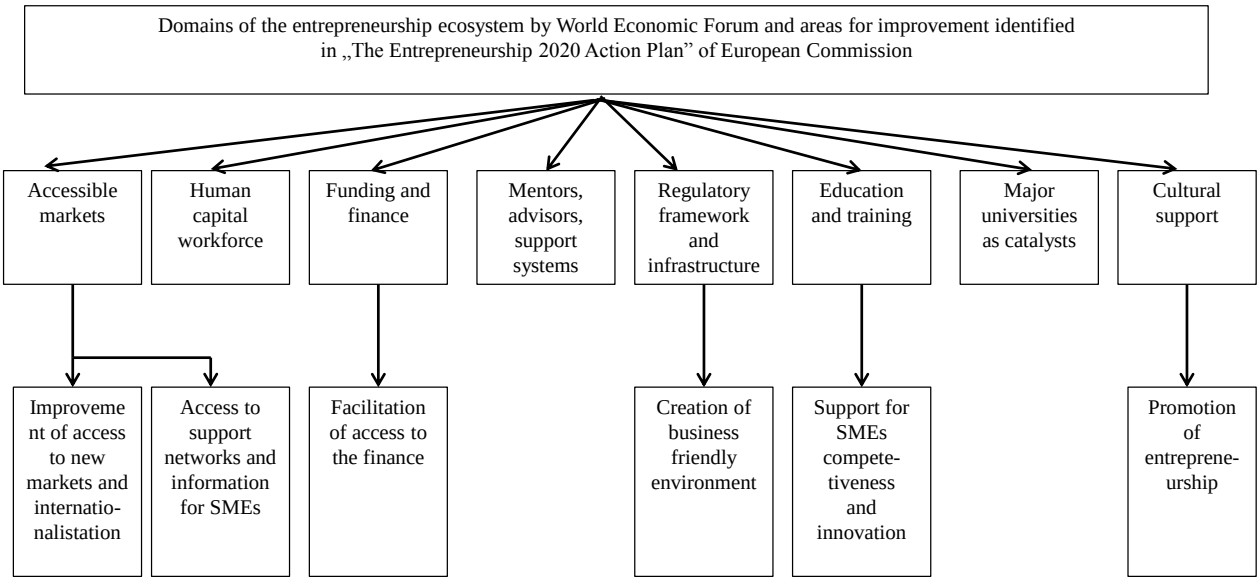
Source: Own elaboration based on "Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics", op. cit., p. 6.

Comparing approach of D. Isenberg with those of World Economic Forum one must recognize importance of institution of education, and role of universities as additional, stand-alone dimensions in entrepreneurship ecosystem.

European Union fosters entrepreneurship, and entrepreneurs are seen by the European Commission as the backbone of Europe's economy: *"(...)They represent 99% of all businesses in the EU. In the past five years, they have created around 85% of new jobs and provided two-thirds of the total private sector employment in the EU*[49]". Principles of European Union aiming to unleash entrepreneurial potential of its member countries are expressed in "The Entrepreneurship 2020 Action Plan", which enables to recognize areas for improvement identified in relation to World Economic Forum entrepreneurship ecosystem model[50].

[49] Entrepreneurship and Small and medium-sized enterprises (SMEs), http://ec.europa.eu/growth/smes/, accessed on 26th of March 2016.
[50] The Entrepreneurship 2020 Action Plan. Reigniting the entrepreneurial spirit in Europe", op. cit.

Figure 5. Areas for improvement identified in "The Entrepreneurship 2020 Action Plan" in relation to World Economic Forum entrepreneurship ecosystem model.

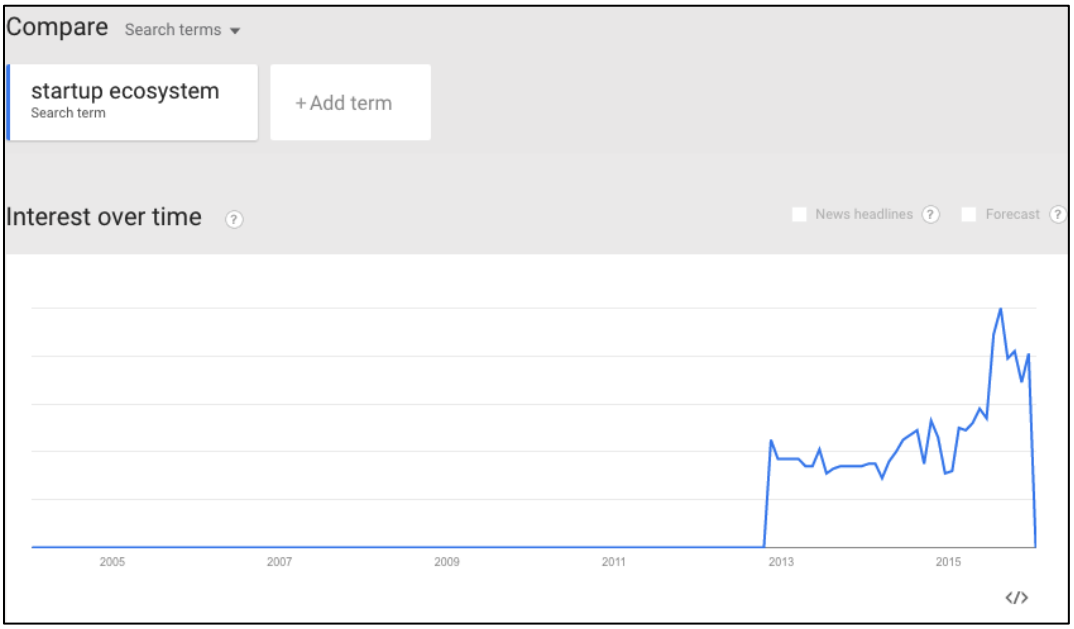


Source: Own elaboration based on "Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics", op. cit., p. 6, and "The Entrepreneurship 2020 Action Plan", op. cit.

Entrepreneurship support in the European Union is fostered by the Small Business Act for Europe (SBA). This document offers a possibly complete, small and medium-sized enterprises (SMEs) policy for the EU and its members. This document together with "Entrepreneurship 2020 Action Plan" define a policy that is supporting the entrepreneurial initiatives and establishes friendly environment for new companies, including small and medium-sized enterprises, and also start-ups, which importance in the recent years has grown significantly, also from the point of view of policy making in the European Union. Google Trends shows that there is a growing interest around the world in start-up ecosystems in recent years. According to Google Trends analysis, "startup ecosystem" research query was barely known 5 years ago. Nowadays the term "start-up ecosystem" is considered as self-explanatory, and is used in articles and books without exploring its meaning or its roots. In our thesis we position start-up ecosystem as a part of entrepreneurship ecosystem focused on particular type of companies. In reference to definition of start-up of S. Blank used before, we define start-up ecosystem as a part of entrepreneurship ecosystem focused on creation and growth of temporary organizations designed to search for a repeatable and scalable business models.

These type of companies require specific and different support than small and medium-sized companies created with intention of execution predictable, proven and safe business model.

Figure 6. Web-context interest in "startup ecosystem" in 2005-2015.



Source: Google Trends, https://www.google.pl/trends/, accessed on 4th of January 2016.

Changes in recent years in the approach of European Union toward new ventures creation led us to a conclusion that phenomenon of start-up ecosystem being part of entrepreneurship ecosystem has gained on its significance. We have observed both supply of new institutional support forms for start-ups created by European Union, and openness for European entrepreneurship ecosystem improvement. Exemplification of this trend is "Start-Up Europe", which is a platform aggregating organizations and institutions supported by European Commission, focused on improvement of European Union start-up ecosystem[51].

"Start-up Europe" derives from European Union Entrepreneurship 2020 Action Plan, and its mission is to connect stakeholders of local start-up ecosystems in EU member countries, including entrepreneurs, start-ups, researchers, co-working places, private investors, public funds agencies mentors, local authorities, and also start-up accelerators, which are subject of research in our thesis.

[51] Entrepreneurship 2020 Action Plan. Reigniting the entrepreneurial spirit in Europe. op. cit., p. 14, p.30.

One of cross-European Union impact efforts undertaken by "Start-Up Europe" in year 2016 was the Start-Up Europe Week, that took place between 1st-5th of February 2016 and resulted in hundreds of events, including conferences, workshops, meetups, or mentoring sessions. Having analyzed activities that took place within recent Start-Up Europe Week we can distinguish the following instruments of start-up entrepreneurship ecosystem:

- "EU Start- Up Europe Club" with over 4 thousand investors interested in funding start-ups at various stage of their development[52],
- "Micro-Grants for Start-Ups" enabling them to participate in relevant start-up events, workshops, and usage of local, start-up dedicated services. Micro-Grants can enable of networking, making connections, and building relationships at European level in relation to calendar of events planned for start-ups stakeholders in 2016[53,]
- "Start-up Future Roadshow" taking place in 1st half of 2016 with series of workshops for students, and aspiring entrepreneurs, where they will find training sessions on funding opportunities, and meet with mentors[54,]
- "European Crowdfunding Network", which is an initiative to support European crowdfunding services providers with self-regulation issues, and strengthen the voice of crowdfunding in policy making discussion to result in growing number of local crowdfunding platforms, and wider access to capital for start-ups[55,]
- Database of almost 300 thousands companies founded in Europe, including funding amounts, and companies' details, which might be a great deal of support in looking for potential business partners, including suppliers, customers, and also mentors[56,]
- "EU Accelerators Assembly", which is a network for start-up accelerator programs in Europe aggregating over 70 start-up accelerators from European Union[57,]

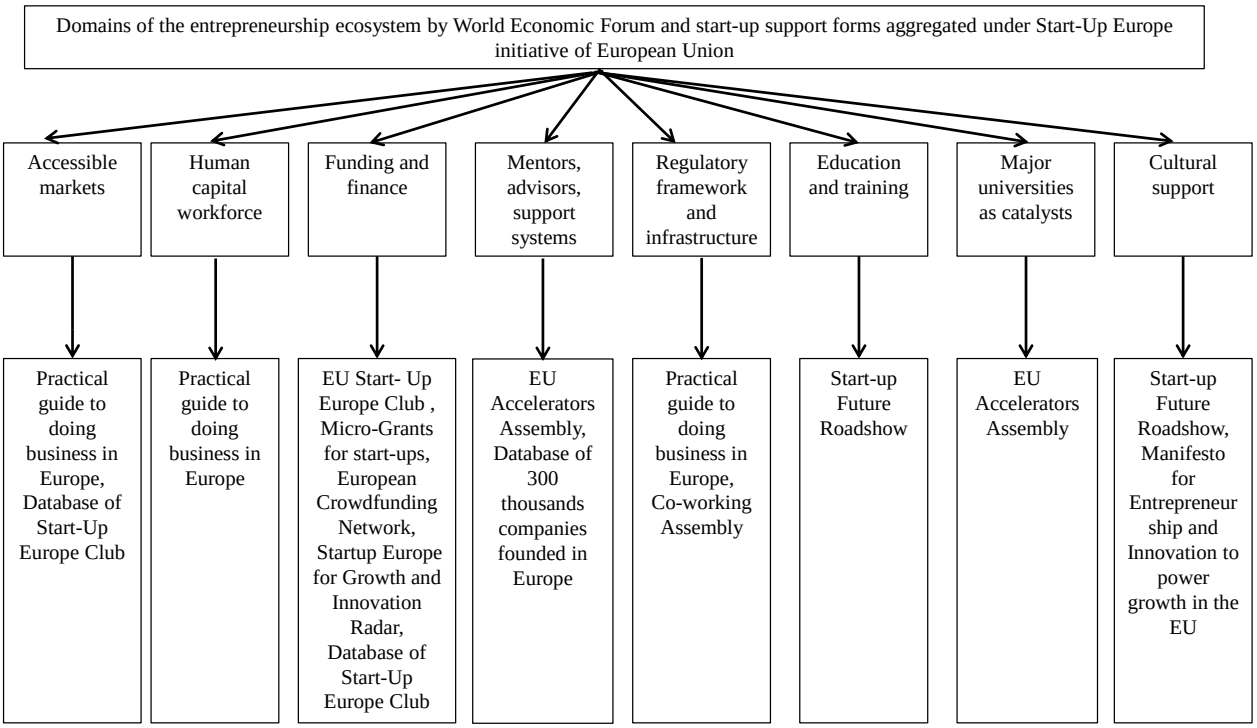
[52] Start-Up Europe Club, http://app.startupeuropeclub.eu/#/investors/table, accessed on 26th of March 2016.
[53] Start-Up Europe Events Calendar, http://startupeuropeclub.eu/events/2016-03/, accessed on 26th of March 2016.
[54] Start-Up Europe Roadshow, http://younginnovator.eu/startupeuroperoadshow/, accessed on 26th of March 2016.
[55] Crowdfunding is practice of funding an undertaking, incl. e.g. a start-up by raising many small amounts of funds from large number of individuals, usually with support of electronic services; European Crowdfunding Network, http://eurocrowd.org/, accessed on 26th of March 2016.
[56] Database of companies founded in Europe, http://app.startupeuropeclub.eu/#/companies/table?q=locations(Europe), accessed on 26th of March 2016.
[57] Start-Up Europe Accelerators' Assembly - http://www.acceleratorassembly.eu/,accessed on 26th of March 2016.

- EU call for financing of international connections between start-up accelerators under co-financing instrument Horizon 2020 in call for projects "Startup Europe for Growth and Innovation Radar". This particular financing instrument enables financing of strategic partnerships between European start-up hubs[58,]
- "Co-working Assembly", where entrepreneurs and start-ups can find registered co-working spaces, and their providers can submit information on the location and services offered[59,]
- Database of Start-Up Europe Club with over 1300 other start-up funding opportunities, including public funds' co-financing[60,]
- "Manifesto for Entrepreneurship and Innovation to power growth in the EU", which is a cultural-aspects-related instrument promoting European start-up ecosystem[61],
- "Practical guide to doing business in Europe" providing practical details for starting a company, including registration of European company online, intellectual property rights protection, selling products and services abroad, employing people in the EU, exploring taxes and customs related issues, or understanding merges and acquisitions[62].

Recent start-up support forms aggregated under Start-Up Europe initiative of European Union combined with World Economic Forum entrepreneurship ecosystem model results in possible structuring of start-up ecosystem are presented in figure below.

[58] Start-Up Europe and Innovation Radar call for projects under Horizon 2020 co-financing scheme of European Commission, https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5069-ict-32-2017.html, accessed on 26th of March 2016.
[59] Co-working Assembly, http://coworkingassembly.eu/, accessed on 26th of March 2016.
[60] Start-Up Europe database of start-up funding opportunities, http://startupeuropeclub.eu/eu-funds-and-support/, accessed on 26th of March 2016.
[61] A manifesto for entrepreneurship and innovation to power growth in the EU, http://startupmanifesto.eu/, and also http://startupmanifesto.eu/files/manifesto.pdf,accessed on 26th of March 2016.
[62] Practical guide to doing business in Europe, http://europa.eu/youreurope/business/index_en.htm, accessed on 26th of March 2016.

Figure 7. Domains of the entrepreneurship ecosystem by World Economic Forum and start-up support forms implemented under Start-Up Europe initiative of European Union



Source: Own elaboration based on "Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics", op. cit., p. 6, and "Start Up Europe" initiatives of European Union, https://ec.europa.eu/digital-single-market/en/startup-europe, accessed on 26th of March 2016.

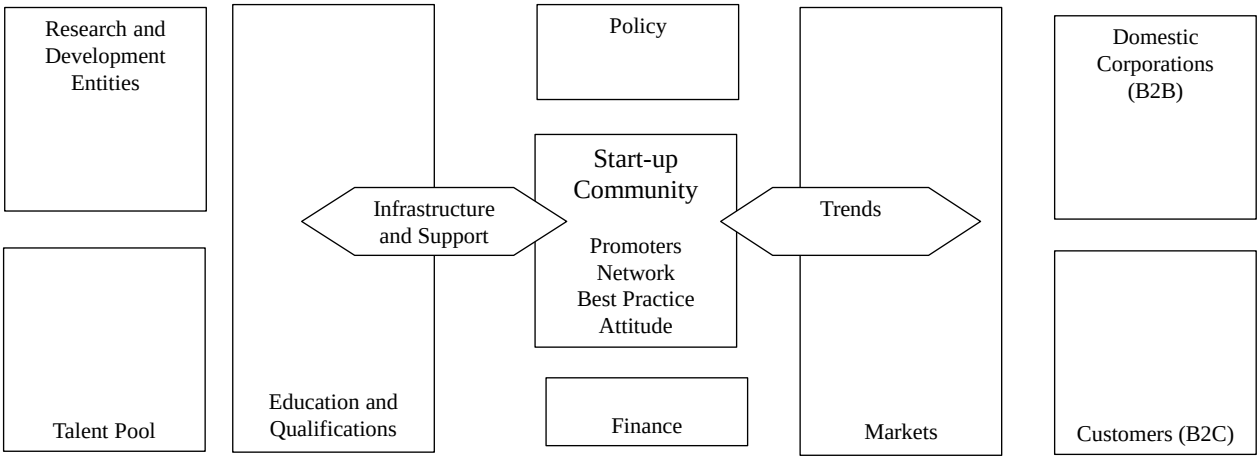
Start-up accelerators have been classified to the "Mentors, advisors and support system", and also "Major universities as catalysts" pillars of entrepreneurship ecosystem model presented above. Nature of start-up accelerator elaborated before and its definition elements enable to classify start-up accelerators to the former pillar. For classification of start-up accelerators to the latter pillar we took into account growing number of university based start-up accelerators, which contribute to catalytic role of universities in creation of new ventures.

Above proposed model is closer to analysis and design of entrepreneurship and start-up ecosystems at country level, however recently new models, relating to analysis and design of such ecosystem at local scale have emerged. One of such models relates to "Entrepreneurship Ecosystem Canvas" worked out by German Productivity and Innovation Centre in 2015, and presented in "The Global Start-Up Ecosystem Ranking 2015"[63].

[63] The Global Start-Up Ecosystem Ranking 2015, op. cit. p. 140.

"Entrepreneurship Ecosystem Canvas" are relatively novel, and start-up communities related approach, differentiating itself from models proposed by D. Isenberg, or World Economic Forum. We believe that through importance of "Global Start-Up Ecosystem Ranking 2015" and it next possible editions, the model might disseminate, proliferate, and gain on significance in upcoming years. Founders of "Entrepreneurship Ecosystem Canvas" argue that the model can be a starting point of a new perspective for start-up community builders and startups on their local ecosystem. By local ecosystem authors mean scale rather of a city, than a region, or a country. The blocks building the model can support identification of key actors of a local ecosystem, connect them with each other, and think holistically about start-ups growth environment as a specific ecosystem. Model proposed by German Productivity and Innovation Centre resembles "Business Model Canvas" proposed by A. Osterwalder and Y. Pigneur in "Business Model Generation"[64]. Success of referred model in contemporary work on start-ups, SMEs, and corporations value proposal can support the argument of "Entrepreneurship Ecosystem Canvas" adaptation. We present "Entrepreneurship Ecosystem Canvas" below.

Figure 8. Entrepreneurship Ecosystem Canvas of German Productivity and Innovation Centre, 2015.



Source: Adapted from "The Global Start-Up Ecosystem Ranking 2015", op. cit. p. 140.

[64] Osterwalder A., Pigneur Y., Business Model Generation, Wiley & Sons, Hoboken, 2010, p. 18-19.

Taking into account quantitative growth of start-up accelerators in recent years and their increasing role in formation of competitive and agile companies, we recognize start-up accelerators as one of the most important factors of start-up ecosystem.

In recent years economic growth has been additionally stimulated by nation-wide initiatives in countries of our research interest (USA, Austria, Poland) such as "Start Up America", "Austrian Start-ups", or "Start-up Hub Poland", where role of start-up accelerators is also mentioned[65]. In our view start-up accelerators of various types mentioned before (corporate and privately held, network, university, public sector, and evolving toward seed funds) can accumulate various forms of start-ups support in one place. Support provided by start-up accelerators ranges from legal and organizational dimension of venture, up to its organizational, technological and strategic dimensions. Therefore we believe that start-up accelerators create peculiar start-up ecosystem in a microscale, and identification of the best practices relating to start-up accelerators activity and institutional support is justified.

Within international literature review performed we did not identify any international comparative analyses of start-up accelerators with learning points and best practices indicated as possible for dissemination and organizational learning. Therefore in order to foster economic development through creation and growth of start-ups with engagement of start-up accelerators we have performed empirical studies focused on gaps identified within international literature review. In next chapters of our thesis we present our methodological approach and results of empirical studies relating to role, and best practices of start-up accelerators in start-up ecosystems, and their interactions with other start-up ecosystem stakeholders.

[65] Start Up America, http://www.eda.gov/news/blogs/2014/04/01/spotlight.htm, accessed on the 6th of January 2016, Austrian Start-ups, http://www.austrianstartups.com/, accessed on 27th of March 2016, Start-up Hub Poland, http://startuphub.pl/about-us/, accessed on 27th of March 2016.

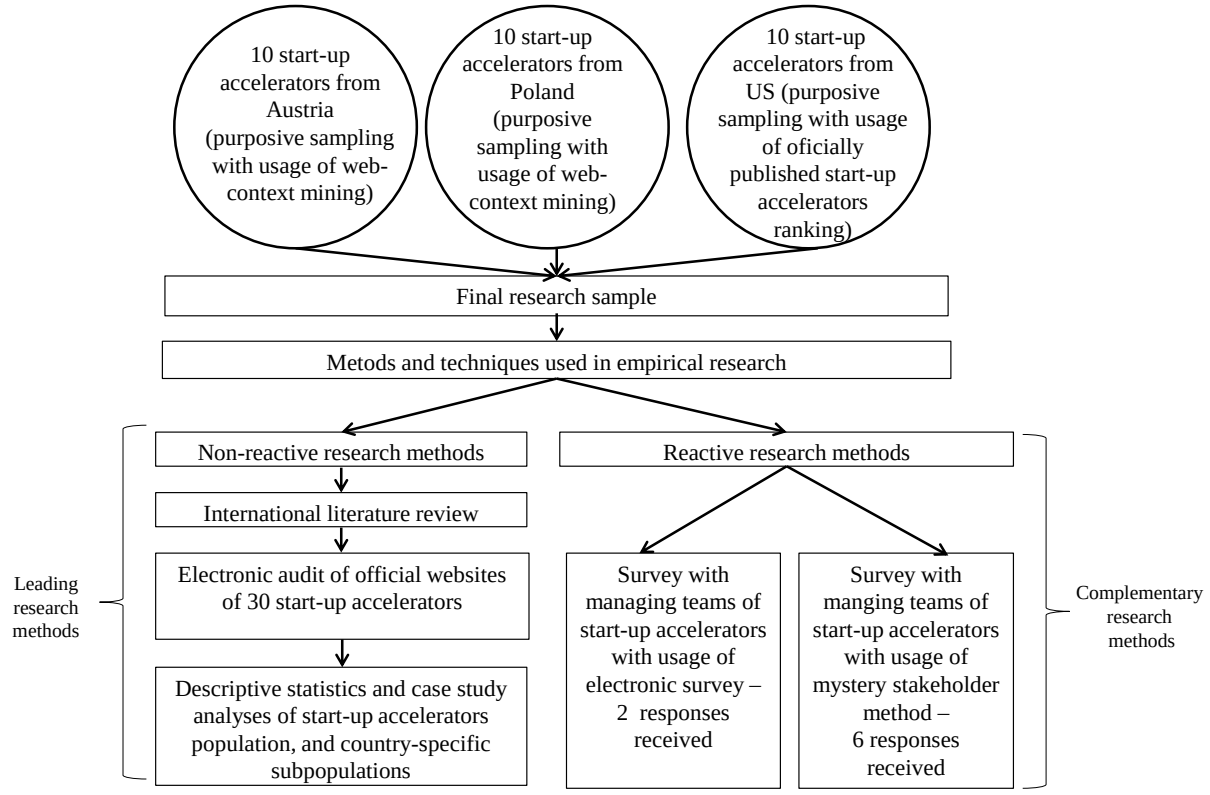
3. Method (Tomasz Pilewicz)

Within the chapter we present approach toward empirical investigation we applied, and its results in relation to purposefully selected samples of start-up accelerators in Austria, Poland and US. In course of the chapter we cover results of electronic audit, electronic survey, and mystery stakeholder method we used to answer the research problem we formulated in chapter 2 of our thesis, and its objectives we formulated in chapter 3.

3.1 Empirical investigation approach and evidence data gathered (Tomasz Pilewicz)

Our research population consists of 30 different accelerators, either officially ranked, and classified as top performing, or with significant digital footprint made by them in the Internet. We focused our attention on 3 countries: Austria, Poland and US; and applied to them research methodology presented in the figure below.

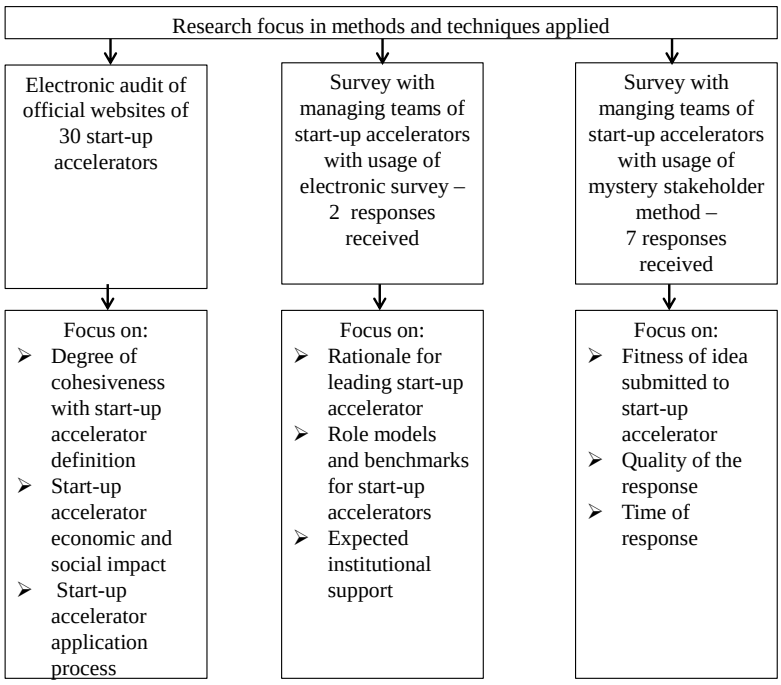
Figure 9. Research results in terms of methods applied to research sample selected.



Source: Own elaboration.

In the sample selection process we used purposive sampling approach to identify and select our research sample. For narrowing down the population of start-up accelerators to find the most representative entities we looked for official rankings of institutions like them. Official ranking was found in relation to the US[66], and first 10 start-up accelerators were selected to the research sample. For narrowing down the research sample in Austria and Poland no official ranking of start-up accelerators was found. Therefore we used web-context mining approach by performing web query for defined word inquiries with popular web search engine[67]. We selected first 10 start-up accelerators identified in each of these countries, which filled start-up accelerator definition criteria. Empirical focus of our methods and techniques of research, and adequate questions formulation was different in each of them. We present it in the figure below.

Figure 10. Research focus in methods and techniques applied.



Source: Own elaboration.

[66] Solomon B., The best startup accelerators of 2015, Forbes Magazine, http://www.forbes.com/sites/briansolomon/2015/03/17/the-best-startup-accelerators-of-2015-powering-a-tech-boom/#30b415e834e4, accessed on 2nd of February 2016.

[67] We performed web query against inquiries of phrase „start-up accelerator" in local languages, these are Austrian and Polish using web search engine of Google (www.google.com). We performed the query between 9th - 11th of January 2016.

In relation to electronic audit of official websites of start-up accelerators we focused on analysis of written and visual content they manifested in relation to the following aspects:

- Information related to the nature of the start-up accelerator with focus on cohesiveness with classic definition of a start-up accelerator[68],
- Information related to the start-up accelerator economic and social impact,
- Information related to the start-up accelerator application process;

Data gathered within the electronic audit were collected in the electronic sheet enabling preparation of basic descriptive statistics and comparative studies on similarities and differences in nature of the start-up accelerators, approach toward economic and social impact related issues, and application process in analyzed populations of start-up accelerators in Austria, Poland, and US. Electronic audit method enabled us to assess all start-up accelerators against certain criteria, and scoring them with 1 for fulfilling the criterion, and with 0 for not fulfilling it. As there were 17 criteria we examined all start-up accelerators against, we were able to create rankings reflected average score of start-up accelerator representing defined country subpopulation, identify distinguishing start-up accelerators, and country specific issues to explore possible best practices spillovers. Within the electronic audit research, all 30 start-up accelerators were analyzed. Electronic audit questionnaire and its results, including above mentioned scoring are presented in appendix 1.

We complemented the data gathered with electronic audit method by electronic survey sent to managing teams of 22 start-up accelerators, which informed about their electronic mail addresses. Start-up accelerators informing about their official electronic mail addresses were represented respectively by 9 start-up accelerators in Austria, 9 in Poland and 4 in US. Within the electronic audit 2 replies were received, both from start-up accelerators located in Poland. Questionnaire of the electronic survey used is presented in appendix 2.

Our electronic research was done to obtain information about the accelerator ecosystems in the 3 countries analyzed: Austria, Poland and United States. We have collected a list of 10 accelerators from each of the three countries. In the case of Austria and Poland we have chosen the most prominent ones, which were dominating the web-context mining and search we performed, but also appeared to have the biggest experience in their field.

[68] Hochberg Y.V, Accelerators and the Regional Supply of Venture Capital Investment (…), op. cit. p. 6.

In reference to the US, the selection was a bit more difficult as the accelerator ecosystem is highly populated and choosing the top 10 as result of web-context mining would not offer a clear picture. Therefore we have decided to follow the ranking made by a reputable publication Forbes Magazine, which is following up on this ranking for some years already[69].

As part of our electronic audit research we analyzed the content on the 30 electronic websites, with particular focus to the following aspects of our electronic audit research objectives:

- Information related to the nature of the start-up accelerator in relation to cohesiveness with classic definition of start-up accelerator (Block I of our electronic audit questionnaire presented in Appendix 1)
- Information related to start-up accelerator economic and social impact (Block II of our electronic audit questionnaire presented in Appendix 1)
- Information related to start-up accelerator application process (Block III of our electronic audit questionnaire presented in Appendix 1)

In the appendix 1 we present structured representation of the electronic audit research results. In that appendix we present three tables with results of the electronic audit research. The first, the second, and the third table is a collection of structured information representing researched start-up accelerators in respectively Austria, Poland, and US.. The three, above mentioned research blocks are marked with different coding colors. The 1st block of questions is marked in green, the 2nd block of questions is blue, and the 3rd block of questions is orange. For every research block marked in a distinct color, a set of from 5 to 7 binary (0-1) questions were put up, as starting point for quantitative analysis, and deeper, qualitative investigation. Number of points gathered by each of the start-up accelerators researched within their subpopulation contributed to overall score of start-up accelerators among aspects researched, and the total score[70].

[69] Solomon B., The Best Start-up Accelerators of 2015, Forbes Magazine, op. cit.

[70] Based on the answers to the questions in the headers, we could define a 0 or 1 answering scheme. For every question in the electronic audit research, next to the 0/1 response, in full versions of coding spreadsheets there was a detailed comment referring to the reasoning of allocating the answer with a 0 or a 1, but also providing additional details. As all three countries have the same number of accelerators in the study, and they are all regarded using the same criteria, we consider a valid comparison between them.

Despite a clear scoring scheme, answers of the researchers were subjective to their own judgement, therefore we see the ranking of start-up accelerators in appendix 1 more of a frame for further discussions and key learnings, rather than a clear picture of a status of the start-up accelerator ecosystems in relation to the countries researched.

We also performed a survey research with usage of mystery stakeholder method, where the electronic correspondence from an electronic e-mail account created for purposes of our thesis was sent to representatives of start-up accelerators. The purpose of the research technique used was to reach out to researched entities from the position of potential beneficiary of their support. There were 6 start-up accelerators which responded to our communication, including 4 start-up accelerators in Austria and 2 start-up accelerators in Poland. Questionnaire used in mystery stakeholder method research was presented in appendix 3.

We conducted empirical research in the following time frame:

- Electronic audit of official websites of start-up accelerators – 11th of January 2016 – 20th of February 2016,
- Electronic survey with managing teams of start-up accelerators – 26th of March 2016 – 10th of April 2016,
- Mystery stakeholder survey with managing teams of start-up accelerators – 13th of April 2016 – 20th of April 2016.

In the following chapter we present results of our empirical research triangulated from research methods and techniques applied.

4. Results (Cristina Maria, Tomasz Pilewicz)

Within the chapter we present results of empirical studies of start-up accelerators in Austria, Poland and US with usage of electronic audit research method, mystery stakeholder method, and electronic survey with managing teams of start-up accelerators. We conclude the chapter with elaboration on key similarities and differences between start-up accelerators researched.

4.1 Austrian start-up accelerators – key observations from empirical research (Cristina Maria)

In the recent years Austria has grown a very vivid start up scene, especially around the cities of Vienna, Klagenfurt and Linz. Vienna as a city with great academic power that offer a legal framework for brilliant minds not only from Austria, but also from other countries, to easily set up a start-up. Many innovative and successful ideas have emerged out of different start-up programs, with the support either of educational system, government grants, but mostly out of private start-up incubators and start-up accelerators.

Start-up accelerator ecosystem in Austria could be split into 2 segments:

- start-up accelerators located near reputable universities and research centers, which focus on technology-based start-ups[71]. We call these start-up accelerators technology-oriented start up accelerators,
- other start-up accelerators where people with promising business idea and entrepreneurial attitude turn to get coaching, access to network of relevant stakeholders, and in the best case scenario--financing. We call these start-up accelerators mainstream start-up accelerators.

Technology-oriented start-up accelerators have the purpose of guiding the scientific minds of research domain into the business world, providing them with support needed in obtaining business acumen, developing proof of principle, and proof of concept of their ideas,

[71] By technology-based start-ups we understand start-ups, which builds its value basing on owned intellectual property, which include among others nonobvious know how, industrial pattern, utility patterns, and patents.

and also matching them with complementary human resources. Technology-oriented accelerator is represented by INiTS, which benefits from the support of the Technical University in Wien, and the Science Park Graz. Technology-oriented start-up accelerators are distinguished by providing not only mentoring and seed financing during acceleration period, but also access to infrastructure, which is adequate to technological nature of projects submitted for support.

The mainstream start-up accelerators are open to various type of stakeholders, encompassing wide range of industries and market segments. Significant part of the start-ups they support are digital technologies oriented ones, these are start-ups delivering software applications, and information technologies tools for different type of final consumers. One of such start-up accelerators in Austria is represented by I5invest. I5invest is focused on mobile internet ventures, and supports start-ups to develop their value proposal, find investors and expand internationally in that particular context.

In Austria, 7 out of 10 start-up accelerators we investigated were located in or around Vienna, therefore we could call it the main start-ups epicenter in Central and Eastern Europe region.

Vienna, thanks to its strong academic infrastructure and human capital footprint, became headquarter for many multinational corporations. For many years the city has been declared as the best city to live in, attracting both tourists, inhabitants, and also investors. Therefore it is not a surprise that vast majority of start-ups and related infrastructure gathers around the city.

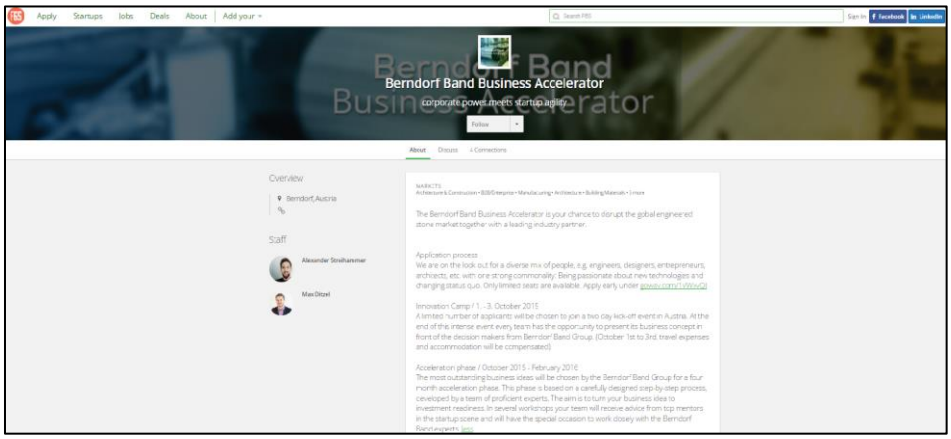
Other, relatively renowned city where start-up accelerators are active is Klagenfurt. Klagenfurt hosts Build start-up accelerator, which is a part of wider start-up acceleration program called AplusB, which is not-for-profit organization affiliated with central government to promote the concept of cooperation between Academia plus Business (AplusB).

What surprised us in our research were start-up accelerators functioning in relatively small, not widely renowned locations. Such location is Berndorf, a satellite village around Vienna, which is a host location for start-up accelerator named exactly as its location, which is affiliated to steel belt solutions provider active in that area. Another example of such start-up accelerator is Kubator, located in Gmund, a small village right next to German border. Kubator offers not only quietness and inspiration easily found in a rural mountain area, but also proximity to the German market, and therefore potential for expansion of supported start-ups to German speaking countries.

Most of the start-up accelerators we researched had their own, official websites, however 20% of researched population was represented by information listed in an umbrella platform for start-up accelerators, where only a limited amount of information was displayed[72].Remaining 80% of start-up accelerators in Austria had their own, official website with comprehensive information for their stakeholders.

Below we present differences between start-up accelerators informing about their offering to their stakeholders through the umbrella platform, and through own, official website. Differences indicating asymmetries of information impacting attractiveness of the start-up accelerators have been exemplified with Berndorf and Kubator start-up accelerators.

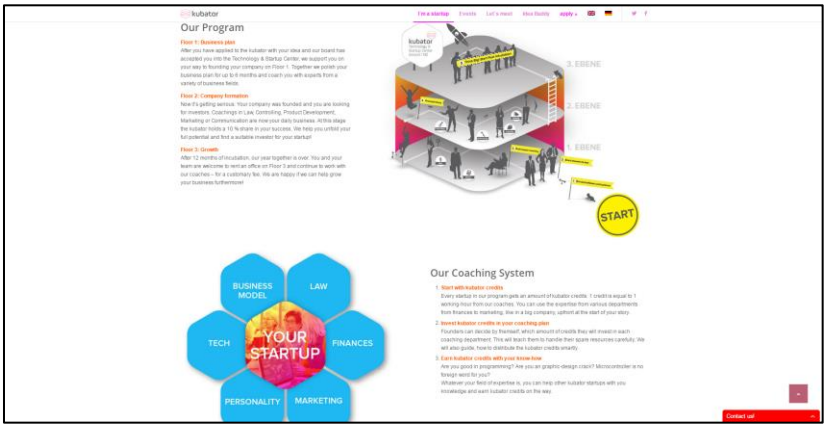
Figure 11. Berndorf start-up accelerator informing about its offering through umbrella platform in extent narrowing information looked by start-up accelerators stakeholders.



Source: Information on Berndorf start-up accelerator at umbrella platform called F6S, https://www.f6s.com/berndorfbandbusinessaccelerator, accessed on 19th of February 2016.

[72] One of such platforms is F6S, which is perceived as umbrella platform gathering founders, and start-up programmes, investors, and talent pool, https://www.f6s.com/f6s, accessed on 19th of February 2016.

Figure 12. Kubator start-up accelerator informing about its offering through own, official website with wide details on value proposal offered.



Source: Information on Kubator start-up accelerator at their own, official website, http://kubator.at/en/, accessed on 19th of February 2016.

Above examples clearly indicate on attractiveness of start-up accelerators value proposal related to the degree, and quality of information shared with their stakeholders. In our view, the more information and higher the quality of information shared, the lower the asymmetry of information related to a decision on turning for support from a particular start-up accelerator.

A specific of the Austrian start-up accelerators is the fact that the management team's contact details are not explicitly listed at official websites of the start-up accelerators. Therefore potential applicants are encouraged to communicate with them in impersonal way, often using general electronic mail addresses.

In 80% of the Austrian start-up accelerators websites, main details on the accelerator set up is easily accessible from the main website, including the duration of the program, the business model (seed investment in exchange for equity, or in flat fees), stage of the start-up life cycle start-up accelerators accept to join the program, type of assistance offered, its quality, and te details of mentoring. Information about exact duration of acceleration support, and clear description of activities organized inside the accelerators are the points where the least information is shared on official websites of start-up accelerators.

We assume that the reason for this might be that some of start-up accelerators adjust their programs to the cohorts of start-ups applying for support, which impacts the type of support expected.

In terms of duration of the start-up accelerator's support, it varies from couple of days up to 18 months, depending on the stage of start-up development and individual approach of every program.

40% of the analyzed start-up accelerators population is supported by not-for-profit organizations, and doesn't ask equity in return for the support during the acceleration stage, what underlines the definition of start-up accelerator proposed by Y. V. Hochberg[73]. However, as this definition was created in more mature and developed start-up support ecosystem of US, we assume that expecting equity in return for support in start-up accelerators based in Austria might change over time.

50% of start-up accelerators we researched in Austria require equity in return of the mentoring received within the program, but these are the accelerators that offer financial support to launch the idea to the market. One of start-up accelerators business model based on idea of growing startups that would become chargeable clients for co-working space offered later on, what in our view resembles the business model of start-up incubators, which are interested in flat fee paid over time for space, and basic business services proposed for start-ups.

Start-up accelerators in Austria that we researched are focused on attraction of entrepreneurs owning an already defined idea, a team, and a working prototype of the invention even at the early stage of the company. 50 % of the programs we researched accept start-up teams to present only an idea and a cohesive team that after a rigorous selection process will turn it into a business plan, and then create a working prototype with support of start-up accelerator mentors during the program. Another 40% of start-up accelerators are more selective, and are open only to already registered companies that own working prototype, and require mentoring, network, and the capital for investment to further grow their business. These start-up accelerators represent subpopulation of those that expect equity for financing, as their investors would like to hedge investment risks related.

Activities offered by the Austrian start-up accelerators we researched are not standardized, and vary from one to another. We found start-up accelerators offering individual mentoring sessions adjusted to demands of particular start-up through access to a competent start-up advisory board, up to a complete education programs covering organizational, legal, financial,

[73] Hochberg Y.V, Accelerators and the Regional Supply of Venture Capital Investment (…), op. cit. p. 6.

marketing, and sales aspects of running a business, and resembling "mini-MBA" in terms of their curricula.

In most of the start-up accelerators the courses and mentorship provided was delivered through internal resources of start-up accelerator or affiliated partners. Having internal resources, or partner for delivering mentoring might impact the costs, however more diversified pool of mentors, open for new-joiners might impact quality of support provided and opportunities created for start-ups. In terms of attraction mechanisms used by start-up accelerators, 60% of them inform about mentors, who are public, renowned persons. Unlike in other countries we researched, surprisingly the start-up accelerators in Austria have rather low synergies with other start-up accelerators and support closed circuit of mentors.

Either they are against the mentors that switch from one start-up accelerator to another, or in order to keep a certain quality it is desired to keep them in-house.

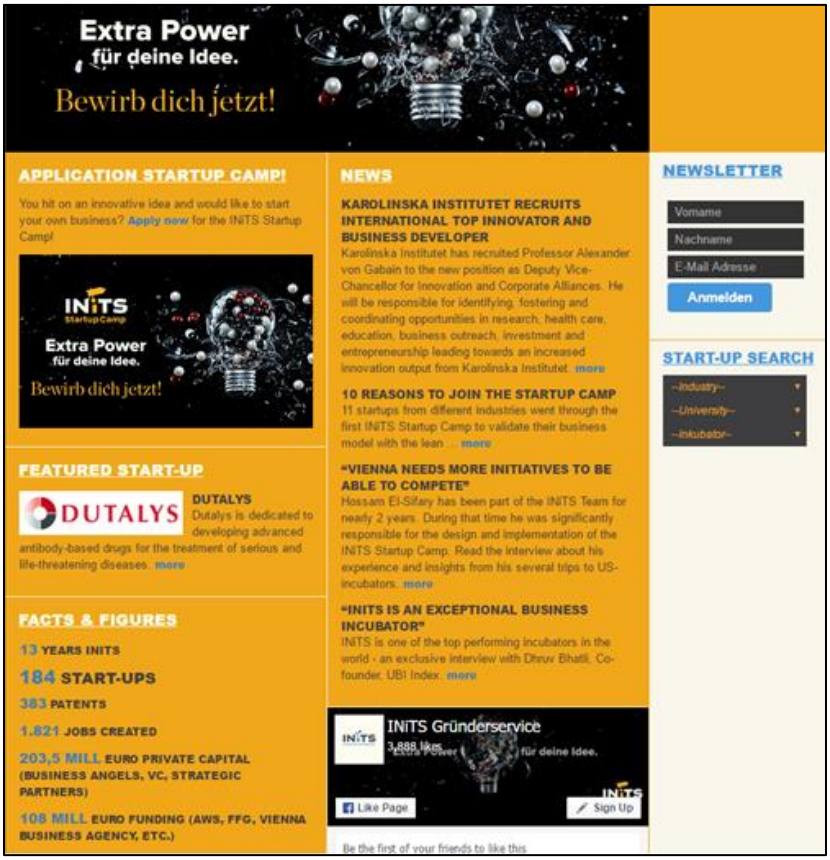
This aspect significantly varies in start-up accelerators we researched in Austria, Poland and US, and we relate to it in further part of our research. In our research we also focused on socio-economic impact start-up accelerators make through their activity, and the way they communicate it. One of the biggest downsides we identified in relation to Austrian start-up accelerators in terms of what they communicate is indication, or overview for the best practices, successes and failure stories related to whom they supported. Austrian start-up accelerators quite often do not share the information on their alumni. Only 60% of them displayed list of start-ups that undertook the accelerator program, out of which half of them reveal useful information such as a brief description or contact details.

Sharing success stories of supported start-ups, and providing contact details belongs to the practices, which is not popular among Austrian start-up accelerators we examined. In our view such practice belongs to one of the key activities, which start-up accelerators might adopt to boost success of stakeholders they support. Part of start-up accelerators might not share this kind of information as per their relatively short life-cycle. The communication of start-up accelerators is rather focused on the application process, less on success stories, impact, and creation of excitement around the support.

Only 1 out of 10 start-up accelerators analyzed displayed straightforward information regarding the impact of their graduates, and provided information on job-places created,

and revenue generated by start-ups that were supported by the start-up accelerator. We present details of this example below.

Figure 13. INiTS start-up accelerator informing about successes of the start-ups supported in 13 years of its existence, incl. job places created, private and public capital attracted, intellectual property rights granted.



Source: Information on INiTS start-up accelerator at their own, official website, http://www.inits.at, accessed on 19th of February 2016.

INiTS start-up accelerator is one of the oldest in Austria, therefore its success stories list might be perceived as impressive. INiTS is supported by the Vienna Business Agency, University of Vienna, and the Technical University of Vienna. The investment capital enabling implementation of start-up accelerator support comes from Vienna Business Agency and private

investors[74].In our research we also investigated application process to start-up accelerators with focus on using own, distinguishing differentiators among each other.

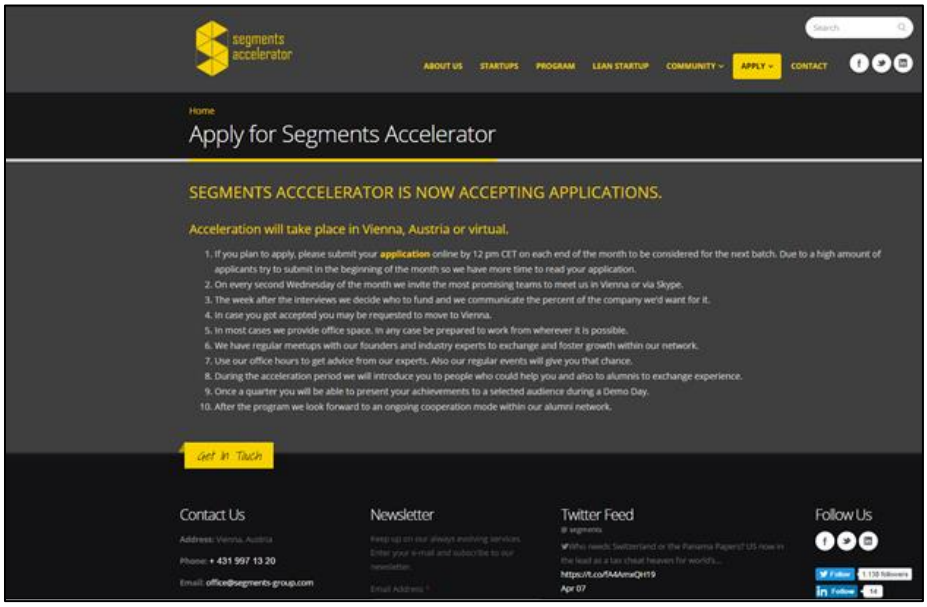
We came across to a finding that 50% of the Austrian start-up accelerators we investigated do not describe their distinguishing practice in any detail on the official website. Besides seed financing, and networking aspects, which are pretty common attractors communicated, it is the unique knowledge, and know-how offered by mentors inside start-up accelerator that constitutes the most valuable asset of such programs. The remaining 50% of start-up accelerators describe, and position their unique practices relating to such aspects as using unique methodology of support, e.g. business model canvas, or defined steps approach of intense acceleration, or also distinguishing office location.

As we live in digital era, we did not expect otherwise, that an online application to start-up accelerator is possible. 100% of the population offered this possibility via dedicated application form, with 1 start-up accelerator establishing this process via electronic mail address, in a more personalized way, not appealing to the rigors of a structured online template.

Interesting enough, (as most start-up accelerators cannot accommodate all the startups that apply for support, and there is an obvious selection process based on industry, business segment, idea potential) within official start-up accelerators websites we examined, only 1 start-up accelerator clearly described participation rules, the criteria and weight of the points in the evaluation process of application submitted. Remaining 9 examples had no clues, or guidelines regarding what should be the most important factors for a start-up to be admitted in an accelerator program, or on what should be the emphasis during the program. We present an example of start-up accelerator clearly defining expectations on above elaborated aspect in the figure below.

[74] Information on affiliation of Vienna Business Agency and INiTS start-up accelerator at official website of Vienna Business Agency, https://viennabusinessagency.at/start-up-and-grow/gruenden-in-wien-startup-in-vienna/gruenden-in-wien-2015/whos-taking-part/inits, accessed on 19th of February 2016.

Figure 14. Segments start-up accelerator providing supportive details regarding application to their program.



Source: Information on Segments start-up accelerator at their own, official website, http://www.segments-accelerator.com/en/apply-for-segments-accelerator, accessed on 19th of February 2016.

In terms of communication channels start-up accelerators use to reach general public, most of them have Facebook pages with information about their activities, and progress made by start-up supported. 60 % of start-up accelerators we studied have their own blogs, and were communicating through social media of Facebook and Twitter. Usually the mainstream start-up accelerators that invite the general public are more active in social media. Technology-oriented start-up accelerators don't have much social presence, and rely on community of experts, and specialists that have been before interconnected.

Austria is perceived as equal opportunity country. Having a strong focus on helping communities and marginalized social groups we analyzed how many start-up accelerators have any preference to support minorities including foreigners, women, people with disabilities, and young graduates.

We have found that Impact Hub Vienna is a start-up accelerator focused on social entrepreneurship with strong mission to support marginalized groups, which reflects support of marginalized social groups even by start-up accelerators[75].

Trying to rank the Austrian start-up accelerators based on a ranking that we created taking into consideration all aspects we researched within electronic audit method, with maximum score of 17 points possible to achieve in categories we were examining, the average Austrian start-up accelerator was ranked with 10,3 points with the biggest strengths in categories related to providing information related to the nature of the start-up acceleration program, and the biggest weaknesses in communicating and evaluating the economic and social impact.

Austrian start-up accelerators need to be recognized for distinguishing activity in replying to potential start-up acceleration stakeholders. Out of 9 mystery stakeholder electronic posts sent to representatives of managing teams of Austrian start-up accelerators 4 of them were replied in a way encouraging formal application for support, and further interaction with start-up accelerator. Start-up accelerators, which replied to our communication from the position of start-up interested in potential support were INiTS, Whataventure, I5Invest, and Build. Response ration of Austrian start-up accelerators in our mystery stakeholder method research was the highest among all subpopulations of start-ups we examined.

4.2 Polish start-up accelerators - – key observations from empirical research (Tomasz Pilewicz)

In Global Start-up Ecosystem Ranking 2015 published by Compass, 7 out of 20 best start-up ecosystems globally is located in the US, whereas in Europe top positions are held by London, and Berlin[76]. Despite already established attractiveness of above mentioned locations, start-up stakeholders, including business angels and venture capital firms, look for new locations of start-up communities with unexplored and underutilized growth potential. In recent years, countries of Central and Eastern Europe, including those, who joined the European Union after year 2004 became to be perceived as regional stars in terms of GDP growth rate and potential for further growth.

[75] See the mission focused on sustainable development of Impact Hub Vienna at their official website, https://vienna.impacthub.net/, accessed on 18th of February 2016.
[76] , Global Start-up Ecosystem Ranking 2015, op. cit., p.23.

One of such countries represented in our research is Poland. According to Piotr Wilam, co-founder of one of the biggest IT companies in Poland, called Onet.pl, Polish start-up ecosystem has two clear poles, which are the cities of Warsaw and Krakow[77]. In our research this statement is reflected appropriately, as 5 out of 10 start-up accelerators we found and researched were located in Warsaw, 2 of them resided in Krakow, and the remaining 3 start-up accelerators were located in Poznan, Torun, and Gdansk. Comparing locations of start-up accelerators in Poland, all of them were located in cities ranging from 203 thousands inhabitants, as in case of Torun, up to 1 million 729 thousands, as in case of Warsaw.

Most start-up accelerators we researched, and the whole start-up community in Poland, are at a very early stage of development. We need to notice that 5 out of 10 start-up accelerators we investigated were organizing their calls for start-up cohorts and acceleration programs for the first time. Polish start-up accelerators look for ways to attract first Polish start-ups, as so far there were almost no start-up accelerators in Poland, and Polish start-ups were using support of start-up accelerators located abroad, including those from Berlin, or London. All start-up accelerators in Poland, in contrary to Austria, lead their own, official websites, and there was no umbrella platform used to inform about start-up accelerators support.

Similarly to the Austrian start-up accelerators subpopulation, only in 30% of the cases a specific contact person in start-up accelerator is mentioned at the official website of start-up accelerator. Concerning the duration of start-up acceleration programs we recognized approaches ranging from acceleration marathon of 5 days of intensive support, through majority of programs ranging from 4 to 6 weeks, up to 12 weeks, as in example of start-up accelerator offering the longest support. In terms of business model used by start-up accelerators, we recognized concentration in 2 groups: the publicly backed accelerators, usually supported with national funds or European Funds enabling creation of such programs in start-up accelerators organized as not-for-profit organizations; and accelerators that are supported by private institutions, either by corporates or venture capital companies interested in participation in future earnings in exchange for up to10% of the equity at the first investment round. Similarly to Austrian start-up accelerators we might distinguish technology-oriented start-up accelerators,

[77] *"The two leading tech centers in Poland are Krakow and Warsaw. Krakow is more compact and networked, Warsaw is very dispered but Google Campus might change that, (...)In general, in Warsaw people are a bit more business-oriented, while Krakow is more technology-centered"*, interview with Piotr Wilam at http://startupxplore.com/blog/polish-startup-scene-bitinspiration-interview/, accessed on 10th of April 2016.

and the mainstream ones. Technology-oriented start-up accelerators in Poland in our research were represented by Alfa.ac, and MIT Enterprise Forum Poland.

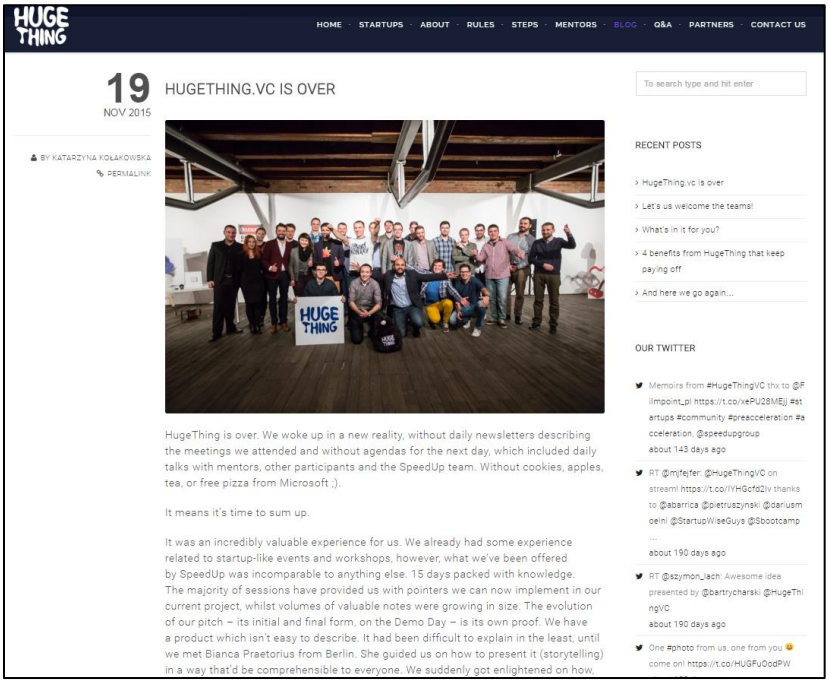
Support focus group of start-up accelerators in Poland are early stage start-ups, but the risk is treated with cautiousness as only few start-up accelerators mention that they would support highly skilled person with only a good idea. 30% start-up accelerators in Poland require minimum viable product, while the remaining 70% expect at least participation of a consolidated start-up team and a bullet-proof business plan.

In 80% of the start-up accelerators researched, relevant details about the mentoring offered were provided. In each of these examples experience of mentors was described, and expectations toward applying start-ups were clearly expressed. Once joining the program, start-ups were encouraged to assimilate quickly, and accelerate their business to profitable stage as soon as possible. As we stated earlier quality of the knowledge provided inside the accelerator program is one of the key factors contributing to success of start-ups. In 100% of the examples of Polish start-up accelerators examined, list of mentors was explicitly exposed at start-up accelerators' we pages. In 50% of the programs the mentors belonged to reputable companies incl. T –Mobile (Deutsche Telekom), Orange, or Google enabling to share multinational way of thinking on business and its scaling. We observed that in Poland multinational corporates participate in start-up acceleration programs, as they are genuinely interested in possible spillovers resulting from cooperation with them, which is additionally supported by favorable tax and state aid system for those, who decide to support start-ups. Remaining 50% of mentor cases present mentors that are already experienced with the start-up scene. To strengthen the ties to international networks, in 50% of the cases the international mentors are brought in, to provide a wider view to fresh entrepreneurs. Only 1 in 10 of the cases analyzed in Poland states the openness to accept voluntarily participation of new qualified mentors that would like to contribute. In terms of information related to social and economic impact made by start-up accelerators, in 80% of the examples the source of start-ups financing is clearly mentioned at the program's websites. The City of Warsaw became promoter of start-up acceleration initiatives, being the owner and organizer of Sprint Accelerator with focus on life sciences and technology, and Warsaw Accelerator focused on support of start-ups located in the city of Warsaw. 'Moreover the city offers honor patronage over other start-up accelerators, what sets the trend for other cities that consider creating and nurturing a local start-up support ecosystem.

Phenomenon not observed in subpopulation of Austrian start-up accelerators is that multinational corporates, incl. Orange and T Mobile (Deutsche Telekom) invest in their own start-up acceleration programs in Poland. The former runs a program called Orange Fab, and the latter a program called hub:raum. Part of start-up accelerators in Poland are led by venture capital companies in order to increase the value of inventions they invest in. Such start-up accelerators are represented by Spedd Up VC, and Gamma Rebels.

As we mentioned earlier, due to early stage of start-up accelerators development, only 50% of start-up accelerators we investigated were formally entitled to share the insights on social and economic impact they made. Still, the accelerators with older tradition proudly displayed either brief information on, or testimonials of alumni, following up steps they took after graduating from the program. Such start-up accelerators are represented by Orange Fab, and hub:raum. Only in 1 example the impact on the society was measured in terms of job places created and revenues generated. Such information was displayed on the blog of the start-up accelerator called Huge Thing, which was located in Poznan. We present it in the figure below.

Figure 15. Huge Thing start-up accelerator providing details of socio-economic impact made in context of start-ups supported since its creation in 2014.



Source: Information on Huge Thing start-up accelerator at their own, official website, www.hugething.vc, accessed on 19th of February 2016.

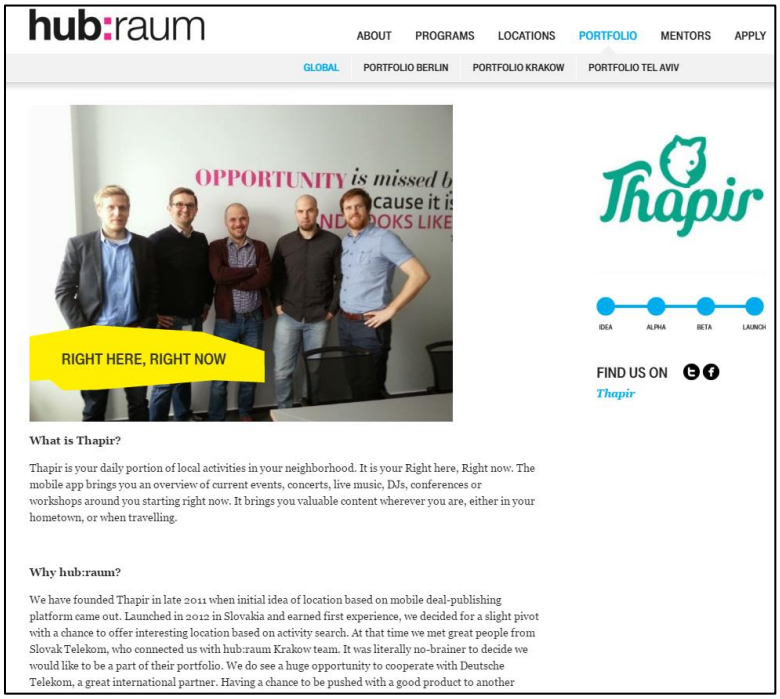
Analyzing the start-up accelerators we perceive them in specific context of competing for start-ups they could attract, and retain. Therefore we believe that having and communicating their own, unique practice is crucial for competing effectively, even at an early stage start-up accelerators market. In relation to subpopulation of start-up accelerators in Austria we recognized distinguishing amenities such as intensive learning programs, or additional services offered in form of office facilities, and co-working spaces. In relation to start-up accelerators in Poland we recognized 1 start-up accelerator with highly distinguishing value proposal in form of formal part of start-up acceleration program taking place in US. Such offering characterized MIT Enterprise Forum Poland start-up accelerator, which program is officially licensed from Massachusetts Institute of Technology in the US.

Regarding the application process, all programs enabled online submission of application. At the time of our research only 3 out of 10 start-up accelerators were open for applications from potential start-ups. Analysis of the application process led us to conclusion that in 100% of examples the industry or industry segment of expected start-ups is clearly mentioned. In 60% of the researched accelerators start-ups needed to have an idea in rather defined field of industry.
The most popular fields were hardware, engineering, and biotechnology. Remaining 40% belonged to custom made solutions expected by Orange, and T-Mobile (Deutsche Telekom), and other to general, not strictly defined fields of digital communication, and software.

In terms of communication 90% of the start-up accelerators have easy accessible communication features, with well-maintained social media including Facebook websites. In addition start-up accelerators in Poland communicate well through Twitter, which fosters communication with US start-ups community, as it is widely used there. Newsletters and blogs are other, widely used forms of communication.

Considering that start-up accelerators alumni are the best ambassadors for the programs to potential applicants, we recognized that only in 40% of the cases, contact details of the former participating companies were listed in a way facilitating interaction. Example of such program has been presented in figure below.

Figure 16. Hub:raum start-up accelerator providing details of supported start-ups, which have own, dedicated websites with contact details to their teams, who are ambassadors of support received.



Source: One of start-ups supported within hub:raum start-up acceleration program, official website of hub:raum start-up accelerator, https://www.hubraum.com/portfolio/thapir, accessed on 19th of February 2016.

Considering the support that the Polish accelerators is giving to certain minorities in business, we recognized that start-ups not only from Poland, but also other Eastern Europe countries are encouraged to apply. What is also distinguishing is that technology-oriented start-ups, and scientists that are inventors are widely incentivized to pursue their ideas for commercialization with support of start-up acceleration programs.

Trying to rank Polish start-up accelerators based on a ranking that we created taking into account all aspects we researched within electronic audit method, with maximum score of 17 points possible to achieve in categories we were examining, the average Polish start-up accelerator was ranked with 10,5 points similarly to Austrian subpopulation, with the biggest strengths in categories related to providing information related to the nature of the start-up acceleration program and the biggest weaknesses in communicating and evaluating the economic and social impact made.

Polish start-up accelerators need to be recognized for their activity in replying to potential start-up acceleration stakeholders.

Out of 9 mystery stakeholder electronic posts sent to representatives of managing teams of Polish start-up accelerators, 2 of them were replied on the day of message sent, or on the day after. In both examples engaging questions were asked expressing genuine interest in supporting the start-up, and encouraging it to submit application for support. Start-up accelerators, which replied to our communication from the position of start-up interested in potential support were Warsaw Accelerator, and Alfabeat. At a glance, Polish start-up accelerators demonstrate professional approach toward start-ups support process, despite the early stage of this forms of start-ups support in Poland.

In our research, there were representatives of managing teams of Polish start-up accelerators, who actively took part of survey basing on structured questionnaire. We received 2 filled questionnaires from alfa.ac, and MIT Enterprise Forum Poland. Both of these start-up accelerators represented technology-oriented ones. One of the most insightful questions answered regarded the degree of dependence of success of start-up accelerators on quality of the mentors provided by the start-up accelerators to the teams supported. Representative of MIT Enterprise Forum Poland shared that: *"In Poland the model called >>train the mentor<< is not popular, whereas in the US it is a standard, that mentors in start-up accelerator are also mentored on how to mentor start-ups effectively. Our start-up accelerator provides senior mentor person responsible for training all of other mentors involved in the programme"* (survey 2, appendix 2). Representative of alfa.ac in the same context shared that adequate mentors are the key in context of preparing technology-oriented start-ups for entering the market: *"Accelerator is based strongly on mentors experience and companies they become, but the main strength of preaccelerator was unique on Polish market target on scientists. A lot of time was dedicated to communication aspects >>how to communicate briefly about the project in way that is understandable to non-science auditoria<< and to build a business approach to their inventions."* (survey 1, appendix 2).

We also learned on how start-up accelerators managing teams define the start-up accelerators for their own purposes. Probably one of the shortest, however valuable definition of start-up accelerator was provided by representative of MIT Enterprise Forum Poland, who said that: *"The objective of start-up accelerator is to make projects investible"* (survey 2, appendix 2).

Representative of alfa.ac defined start-up accelerator as "*Program that help projects >>mostly in seed or early growth phase<< and their founders to build its strengths, MVP >>minimum viable product – T.P.<< and business skills supported of experienced mentors form various branch. It also provides them with big contacts network".* In that context of question regarding collaboration with other start-up accelerators in Europe, representative of alfa.ac shared that: "*We cooperate with ABC Accelerator, Axel Springer Plug&Play and 500 startups. Basically there are no problems cooperate together."* (survey 1, appendix 2).

To conclude characteristics of subpopulation of start-up accelerators in Poland, despite relatively early stage of development of this form of support of start-ups we observed that they demonstrate professional approach toward start-ups support process, recognize, cooperate with, and use other start-up acceleration programs as reference points to learn from.

4.3 US start-up accelerators – key observations from empirical research (Cristina Maria, Tomasz Pilewicz)

US has been widely named in popular culture as 'the country of all possibilities'. Being the country with the most thriving entrepreneurial spirit, it also the birthplace of start-up accelerators' movement. In 2005 with support of business angel Paul the first start-up accelerator filling up definition of start-up accelerator in modern literature was set-up[78]. In next couple of years Y-Combinator contributed to creation of such companies like AirBnB, Dropbox and Reddit, which all were alumni of its support.

The idea of taking high potential start-ups through professionalized mentoring raised attention, and soon the US start-up ecosystem was populated with more similar initiatives. In year 2007 David Cohen started another, contemporarily renowned program called Techstars in Boulder[79]. By the end of 2015, more than 170 different accelerator programs have been launched in US, with a rapid growth rate from year to year, which is the highest number of this form of start-ups support per country[80].

[78] First start-up accelerator filling its modern definition is considered to be Y-Combinator, created in 2005, Hochberg Y.V., Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model, op. cit., p. 2.
[79] Ibidem.
[80] Hathaway I., Accelerating growth: Startup accelerator programs in the United States, http://www.brookings.edu/research/papers/2016/02/17-startup-accelerator-programs-hathaway, accessed on 14th of April 2016.

In that context visibility of particular start-up accelerators is a key factor to be distinguished in US start-up accelerators world. In our research we decided to focus on top 10 start-up accelerator programs nominated by the Forbes Magazine[81]. The ranking encompassed selection criteria of professional knowledge of start-up accelerators teams, power of investments made, and also degree of variety, and accessibility for people to start-up their business.

Start-up accelerators in US are widely distributed in terms of their geographical locations, however we can recognize their clusters in Silicon Valley, Great Boston Area, New York Area, and also Chicago. As the supply of new business ideas in the US is high due to its population, there is relatively quite limited access to start-up accelerators management boards. In our research we neither received filled in survey, nor reply to mystery stakeholder method from US-based start-up accelerators we examined, in contrary to their Austrian-based and Polish-based counterparts.

The duration of the programs we researched varies between 3 months up to 1 year. Some start-up accelerators accept more than one cohort of start-ups per year, what results in more admission chances, but also increases the pressure for those admitted to perform in relatively short period of time.

We recognized clear tendency towards the equity investment business model. 90% of start-up accelerators examined required equity in return investment within the start-up acceleration program. Also in the communication of the programs, the main emphasis is on the investment power, rather than on mentoring and knowledge sharing.

In 10% of examples equity was not required when participating, as start-up accelerator belonged to not-for-profit organization based on donations. Even accelerators affiliated to universities required an equity sharing, like New Venture Challenge located in Chicago.

In context of start-ups life cycle, we identified tendency towards early stage start-ups. The more advanced the start-up in terms of their minimum viable product, or working prototype, the higher the probability of bigger sum investment at lower equity rate expected in exchange.

For the duration of the program, in all examples researched the strongest focus was given to getting the product on the market as soon as possible. As a result of that high attention was given to mentoring aspect of the programs and usage of expertise of the accelerators' network.

[81] Solomon B, The Best Start-up Accelerators of 2015, op. cit.

Key differentiator of US start-up accelerators is that the information, knowledge, and know-how needed is pulled by the them on active, constant basis, what differentiates them to Austrian and Polish start-up accelerators, which in majority of examples organize delivery of information, knowledge, and know-how in form of seminars, and workshops.

This differentiator is linked with another characteristic of US start-up accelerators, which is open, and growing pool of mentors. US start-up accelerators effectively use their previous alumni in mentoring the new generations of start-ups, and by this create a snowball effect to enlarge their organizations, and network effects they create. 8 out of 10 US start-up accelerators informed about details of their mentors and their professional backgrounds, which was the highest ratio within all start-up subpopulations we researched in Austria, Poland, and US.

The founders of the accelerators, being business angels and venture capitalists also act as mentors and network connectors-- so called "door openers". We also recognized certain degree of openness of the accelerators to get new contributors in form of mentors, as in 40% of US start-up accelerators researched there was an invitation not only for new investors, but also for mentors who would like to share their knowledge, know-how, and network. We have neither observed such practice in Austrian start-up accelerators examined, nor Polish ones.

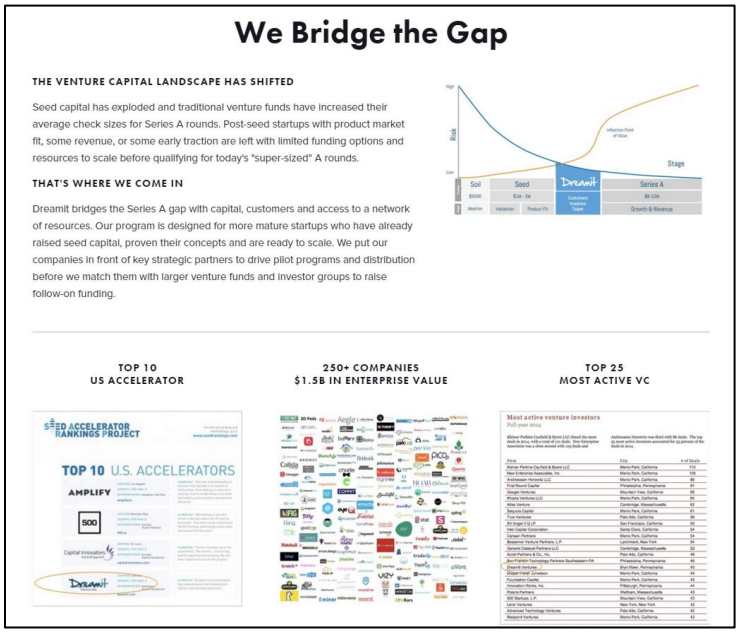
When analyzing start-up accelerators investment sources in 100% of the cases the foundation source is clearly stated. One start-up accelerator sourced its funding from university funds through private donations of listed sponsors. There was also one start-up accelerator using crowdsourcing as basic form of investment in the start-ups. However remaining of 80% of the start-up accelerators were backed-up with private funds, and were focused in investments in exchange for equity.

Regarding the types of start-ups supported by the accelerator programs, only 60% of them had clear expectation of industry, or market segment represented by the start-up. The diversity we mentioned in the beginning is also visible by analyzing this point, where only 1 accelerator, Techstars is clearly technology-oriented. The rest of start-up accelerators expect the ideas from various industries.

US start-up accelerators had the highest percentage of demonstration of social and economic impact on start-ups support among all subpopulations we examined, including Austria, and Poland.

In 60% of US start-up accelerators analyzed, the impact on the social and economic environment was explicitly noted on their official websites. An example has been shown in the figure below.

Figure 17. Dreamit start-up accelerator providing details of socio-economic impact made in context of start-ups supported since its creation in 2007.

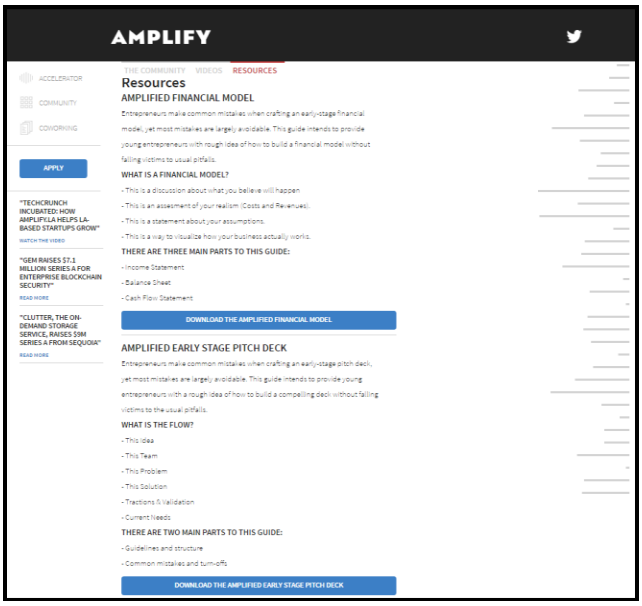


Source: Information on Dreamit start-up accelerator at their own, official website, http://www.dreamit.com/dreamit/#welcome, accessed on 19th of February 2016.

Analyzing the application process and the set-up of start-up accelerator's programs, we arrived to conclusion that the programs with the longest tradition also have the most conventional approach. The more newly founded start-up accelerators, the more original the means to differentiate and attract start-ups such as keeping a strong connection with the accelerator founders through a small and "intimate" cohort, as in the case of AngelPad, offering them access to accredited investors, or offering sponsored benefits during the acceleration phase. We identified one of the most interesting, distinguishing approaches related to the application process in Amplify accelerator located in Los Angeles. This start-up accelerator was the only one in the pool of 30 start-up accelerators from 3 countries we examined, which provided potential applicants with state of the art business presentation template (also known in the start-up world as "pitch"),

and the template for preparation of basic financial model. Both templates were available without the need of applying for it, and each of them contained detailed instructions for filling them in, and using them in business practice. We presented this practice in the figure below.

Figure 18. Amplify start-up accelerator providing business presentation template and financial model template for stakeholders of its official website.



Source: Information resources of Amplify start-up accelerator at their own, official website, http://amplify.la/community#resources, accessed on 19th of February 2016.

In all examples of start-up accelerators analyzed, online application was available, and as most accelerators offered more than one cohort each year. At the time of the research 80% of the programs were admitting applicants, what was the highest ratio among all start-up accelerators subpopulations we researched in Austria, Poland and US.

Regarding transparency of the recruitment, and selection criteria, detailed information was provided only in 30% of examples, including MuckerLab, New Venture Challenge, and Alchemist Accelerator. In some of other examples, the application and recruitment steps were described clearly, however with no indication on tips and tricks, or any other guidelines.

Still for new potential participants of start-up accelerators in the US it was relatively easy to get impressions of the experience related to participation. In 80% of start-up accelerators researched a full and comprehensive list of former participants was listed at the program websites.

We came to a conclusion that for US accelerators, where the competition among themselves is relatively the highest, communication is crucial, and even more important than in case of Austrian and Polish start-up accelerators we researched. Therefore all US start-up accelerators have attractive social media profiles, 60% of them were sending out their own, periodical newsletters and 30% ran blogs to keep their members engaged, and to share the news via social media.

When it comes to special support awarded to minorities in business, we acknowledge the fact that the start-up accelerators that were affiliated with universities had strong preference of admitting their students, teaching staff, and affiliates from the university. One accelerator that has a wide international focus was additionally arranging visas, and offered country transition related support for external applicants.

In context of ranking we created, taking into account all aspects we researched within electronic audit method, with maximum score of 17 points possible to achieve in categories we were examining, the average US start-up accelerator was ranked with 13,1 points. It was the highest rank among all subpopulations of start-up accelerators we researched.

The biggest strengths of US start-up accelerators were demonstrated in categories related to providing information related to the nature of the start-up acceleration program, and the biggest weaknesses were observed in communicating and evaluating the social and economic impact made.

However the degree to which US start-up accelerators informed about social and economic impact made in comparison to Austrian, and Polish subpopulations was higher by respectively 50%, and 43%.

4.4 Key similarities, and differences among start-up accelerators in Austria, Poland, and USA (Cristina Maria, Tomasz Pilewicz)

Within this subchapter we conclude our research and relate to the thesis problem and objectives formulated by comparative analysis of the research results among of subpopulations of

Austrian, Polish, and US start-up accelerators. We indicate scientific effects of our research.

In our view contemporary economy is characterized by speed of transactions being done, shorter new product development cycle, and life cycle of new products and services themselves. In that context plethora of opportunities become the object of interest of investors and investment decisions related. As technology-oriented and other new products and services in early stages of development are prone to high investment risk we recognize start-up accelerators as catalyzers of the process and instance of selection enabling to make investment decision with higher degree of certainty.

Below we present the results of the ranking we prepared based on results of our electronic audit research and comprising of 17 questions we assessed against each start-up accelerator from Austria, Poland and US (appendix 1). We also present the table with key differences we observed between Austria, Polish and US start-up accelerators using electronic audit questionnaire, electronic survey to managing teams, and mystery stakeholder method. Basing on these data we formulate observations contribution to the thesis problems and objectives. .

Table 4. Quantitative results of electronic audit research enabling to rank subpopulations of start-up accelerators from Austria, Poland and US

Criteria in electronic audit research	Start-up accelerators in Austria (score achieved in our ranking vs maximum score possible)	Start-up accelerators in Poland (score achieved in our ranking vs maximum score possible)	Start-up accelerators in USA (score achieved in our ranking vs maximum score possible)
Information related to the nature of the start-up accelerator with focus on cohesiveness with classic definition of start-up accelerator (questions of Block I of electronic audit questionnaire, and electronic audit research results presented in Appendix 1)	45/50	42/50	49/50
Information related to start-up accelerator economic and social impact (questions of Block II of electronic audit questionnaire, and electronic audit research results presented in Appendix 1)	22/50	23/50	33/50
Information related to start-up accelerator application process (questions of Block III of electronic audit questionnaire, and electronic audit research results presented in Appendix 1)	35/70	41/70	46/70
Total	102/170	105/170	132/170

Source: Own elaboration.

Results achieved by US start-up accelerators were higher in all 3 blocks of questions we answered when performing electronic audit research. In overall ranking US start-up accelerators demonstrated higher intensity of phenomena we investigated by 29% in comparison to Austrian start-up accelerators, and by 25% in comparison to Polish start-up accelerators.

The biggest differences had been observed in practices related to sharing information on economic and social impact made by start-up accelerator, and then start-up accelerator application process. Quantitate analysis of results of electronic audit research we performed doesn't provide substantial input for the learning points possible for the start-up accelerators in Austria and Poland from US, and vice versa, for US based start-up accelerators from Austria and Poland. Therefore we deepen our analysis by adding qualitative aspects of start-up accelerator dimensions We performed comparative analysis of start-up accelerators taking the following criteria into account running official website by start-up accelerator, providing contact details to its management at its official website, duration of the programme, equity required in exchange for support provided, focus of support provided, institutional partners of the programmes, distinction between technology-oriented and remaining programmes, requirements referring to maturity of product, or service at moment of application to the programme, demarcation of industries start-up accelerator is interested in, sources of mentors involved in the programmes and availability to apply to become one, shared success stories of start-ups supported, providing information to programme alumni, providing information on impact of start-up supported, providing guidelines for applicants, and start-up accelerators physical locations. We provide the summary of our research in the table below.

Table 5. Start-up accelerators in Austria, Poland and US – key similarities and differences observed

No.	Criterion being basis for indication of best practices and final recommendations	Austria	Poland	USA
1	Running own official start-up accelerator website	Not always	Always	Always
2	Providing contact details to management-team at official website of start-up accelerator	Rarely	Often	Very rarely
3	Duration of start-up accelerator program	From couple of days up to 18 months	From 5 days up to 12 weeks	From 3 months up to 1 year.
4	Equity in return for support	Often (50% of examples researched)	Very rarely (No examples in sample researched found)	Very often (90% of examples researched)
5	What is the strongest, practical focus of support?	Strengthening the business plan, validating minimum viable product	Validating the minimum viable product, enabling participation in product/service demonstration event (demo-day)	Launching the product at the market as soon as possible
6	Business angels and venture capital companies are institutional partners of start-up accelerators	Rarely	Very rarely	Very often
7	Clear distinction between technology-oriented start-up accelerators, and remaining ones	Exists	Exists	Does not exist (1 out of 10 start-up accelerators researched)
8	Minimum viable product, or working prototype is required to join the program	Very rarely	Often	Very often
9	Is industry or market segment from which start-up comes from clearly defined	Yes	Yes	No

10	Source of mentors involved in support of start-ups	Internal resource, official partners	Internal resource, official partnerw, or *ad hoc* recruitment	Internal resource including start-up accelerator alumni, official partners
11	Does start-up accelerator run continuous call for new mentors?	No	No	Yes
12	Success stories of programs' alumni are shared	Rarely	Rarely	Very often
13	Information about programs alumni is provided including contact details	Rarely	Rarely	Very often
14	Socio and economic impact of start-up accelerator is measured in quantified way (job places created by start-up supported, investment in start-ups done)	Rarely	Rarely	Very often
15	Guidelines for application, and information on evaluation process is provided	Very rarely	Rarely	Rarely
16	Location in urban, densely populated area	Not always	Always	Not always

Source: Own elaboration.

5. Discussion, recommendations and conclusion (Cristina Maria, Tomasz Pilewicz)

In the final chapter of our thesis we provide discussion over the results of our empirical research, and also conclusions based on both literature review and empirical research performed.

We recognize that the development of startup accelerators in the countries we analyzed had a different starting point, but also has followed a different path along the years. Although we see tha US accelerator ecosystem is clearly more advanced in regards of the spread, the awareness of the concept in the startup world, we do not treat US as a clear benchmark for all compared dimensions and a direction for development for the start-up accelerators in Austria and Poland.

Aim of our research was to identify the similarities and differences between the 3 experiences in order to better understand how they could contribute to the performance of the start-up scene and its institutional environment. In the quest of identifying synergies or successful ideas that could be considered for adaptation and implementation is strong involvement of universities in support of start-up accelerators in from Austria, including example of Technical University of Vienna, which has been a partner for INiTS start-up accelerator for many years. We believe that as the US has strongly funded universities, the partnerships between tertiary education institutions, and start-up accelerators could not only contribute to entrepreneurship ecosystem, but also safe start for young entrepreneurs in early stage of their undertakings, where business angels and venture capital firms as basic source of founding are considered. In relation to the application experience, the official start-up accelerator websites in Austria and Poland appeared to have less complicated application processes and formal aspects related. We believe that the context of US start-up accelerators with more application entries per start-up accelerator justifies detailed application process, however we recognize potential for balance of scope of information required in order to attract more potential applicants.

Particularity for Poland is that every start-up accelerator defines the methodology of support as its own, often creative approach differentiate from other start-up accelerators, thus might impact on attracting the candidates. At the opposite pole we recognize a trend in the US of following the methodology of support of renowned start-up accelerators, including Techstars, or Y-Combinator.

An interesting factor in compared subpopulations of start-up accelerators was approach to defined social groups or minorities in the selection process. We identified that in the examples analyzed in Austria and Poland social groups such as like women, citizens of Eastern Europe, or social entrepreneurships were additionally encouraged, whereas in the US we identified form of "positive discrimination" in application process. By this we mean prioritizing affiliates of universities, environments to apply. By considering Austrian, and Polish approach the US accelerators could increase diversity of start-up supported.

In the US community of start-up accelerators grown over the last decade, they created clusters in Silicon Valley, Great Boston Area, New York Area, and Chicago. Similarly in Austria, particularly Vienna, due to the proximity of human capital hubs, and faculties of Vienna University of Economics and Business, Technical University of Vienna, and tertiary education institutions of Linz, and Graz, startup accelerators has rooted, contributing to start-up support ecosystem in Central Eastern Europe. In terms of timing, the accelerator trend has reached Vienna already 11 years ago with the birth of INiTS, start-up accelerator with longest tradition in Austria We observed that location of start-up accelerators in Austria in proximity to Germany speaking countries allows scaling-up business activity to so called DACH market comprising Germany, Austria and Switzerland.

In Poland, the context of start-up ecosystem support is different, as per early stage of their development and high concentration of start-up accelerators in capital city of Poland, which is Warsaw, and status of organizing 1st or 2nd edition of acceleration programs by most of start-up accelerators we researched. In terms of the business model we identified more not-for-profit initiatives in Austria and Poland than in US, where high focus on equity-based financing is given.

In Poland, even more than in Austria, the start-up accelerators that are supported either by the municipality or by universities do not require equity for support, what might partially impact popularity of the programs. We observed that tough selection process is one of the reasons behind the fact that the US programs are mostly equity based and open access to well-known venture capitalists for further funding.

The competition to join one of the well-known US accelerators like Y-Combinator is from about 4000 applicants per call for applications in comparison to 100 applicants per program in calls organized in Austria or Poland[82].

[82]"*At TechCrunch Disrupt on Tuesday, Y Combinator's Harjeet Taggar said that the incubator's next class will have*

Regarding the stage of the startups lifecycle accepted in the accelerators we analyzed we could not indicate if there is a certain preference for a start ups stage in any of the countries, but we observed wider flexibility in Austria to accept ideas and business plans only, in comparison to Poland, where most startups should present a minimum viable product or a prototype to minimize the risk of a company present in an emerging market. US also has a tendency towards already running projects, with the amendment that in some cases there is a preference for a consolidated specialist team over the idea or prototype. The start-up accelerators in Europe are more focused on education under organized form, like workshops, seminars, and a push style learning method, where every participant receives similar learning experience and acceleration tools, whereas in US there is a greater focus on mentoring model where the inventors sit in the driver seat pulling the information, knowledge, know-how and the connections from different people engaged in the acceleration program.

The quality of start-up acceleration programs depends on their education curriculum, quality of the organizers and mentors involved. Austrian start-up accelerators we researched relied mainly on internal mentors, and partners with strong connections with the accelerator. Those are either people who are working on contract basis with the accelerator, or people with strong connection with the accelerator. In relation to Polish accelerators, in many examples mentors were hired on *ad hoc* basis and shared their experience with the participants. What US start-up accelerators manage, is to keep the program graduates tied to the program also after graduation, sharing their success and failure stories to the new rookies.

The graduates become mentors and ambassadors for the program later on, and enable organizational network to grow in organic way.

There is a striking similarity regarding the fact that 90% of all start-up accelerators in all three countries we analyzed disclose the foundation source enabling their activity. In all countries the academic environment shows a strong presence in founding and promoting part of innovation, especially in the area of scientific research, which are in the interest of technology-oriented start-up accelerators. A peculiarity of the Polish start-up support ecosystem is the support given by the municipality of Warsaw for setting-up, conducting, and offering patronage for start-up accelerators.

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at least 80 startups, up from 65 in the prior group. Even though Y Combinator is hosting its largest class ever, it was also the most selective class the incubator has ever had, with just a 2 percent acceptance rate", http://techcrunch.com/2012/05/22/ycombinator-80-strong/, accessed on 19th of February 2016.

Austrian start-up support ecosystem supported by private corporations that enable innovations in technological domains dominant pattern in the funding specimen. For US, the donation system seemed to be working in the case of 20% of all start-up accelerators we analyzed, and remaining 80% was backed-up with private capital, which basing on popularity of US start-up accelerators, start-up community trusts. Not significant in terms of quantity source of founding we identified was crowdfunding.

The tradition and the background of the accelerators is a defining reason for the clear differences between the measurements of the impact of the accelerator, the graduates and graduated startups on the society or any social group.

In Poland half of start-up accelerators analyzed were before organizing 2nd edition of their program, what undermines measurements of their effectiveness, social and economic impact made. In Austria, we found clear indication in the case of an accelerator with long tradition and startup success, and significant contribution to local, regional, and national economy, which is a practice we consider worth to follow.

Also in Austria some accelerators are relatively fresh in the community, and others are company dedicated, therefore with a limited impact area.

Finally in US, the analyzed start-up accelerators are more often measuring the impact, however still in most of the cases the figures are only rough indications without showing a comprehensive analysis like the example of INiTS from Austria.

The degree of openness to new mentors by encouragement for submitting expression of interest for mentoring do not satisfy us in relation to all subpopulations analyzed, as only 40% of US, 10% of Austrian and Polish start-up accelerators were open for new mentors from outside of start-up accelerator.

Still having observed that 40% of the top 10 US startups are open to new mentors and specialists, we consider this practice as recommendable action worth disseminating in context of the best practices for start-up accelerators community.

In context of the application process, we conclude that in all three countries it is rather subjective, and only in 30% of examples in US and only 10% in the case of Austria and Poland, clear criteria and weight of the points in the evaluation process is detailed. It is hard to assign a score or a potential for a phenomenon as uncertain as a start-up.

In many examples the evaluation is done based on the affinity of the founders, or the idea with the program and the judgement of the jury concerning the degree of innovation. Therefore we recognize this area as the room for improvement in all examples of start-up accelerators analyzed, what could contribute to their credibility and reputation.

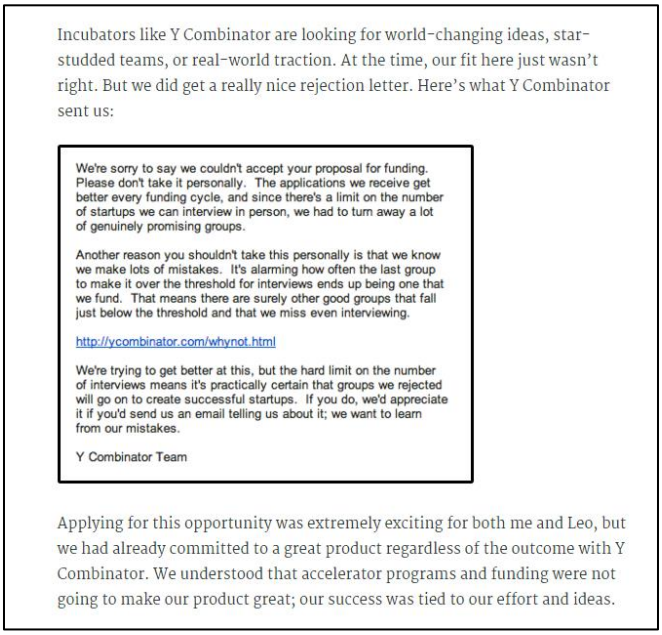
Concerning the availability of the data about participants and former participants the US start-up accelerators had the highest quality set up, with 80% of start-up accelerator's websites covered with comprehensive data of start-ups supported, their description and often also direct contact details. In population examined in Austria, in 60% of examples we identified former participants by the data given on the website and in the case of Poland in 40%, what could be explained by relatively early stage of start-up accelerators' life in that country.

In Austria one of the reason which lead to a lower number is the fact that especially the corporate accelerator programs don't have standalone websites, the application is published in umbrella platform called F6S we mentioned in earlier part of our thesis. Maintaining own start-up accelerator website requires effort and investment, however we believe that potential returns are incomparably higher in terms of content, visibility, and building trust. Therefore we recommend undertaking of this activity as other best practice we recommend.

In terms of communication, US accelerators have developed over the time a state of art communication mix, involving websites, blogs, newsletters, and social media. One of the most valuable marketing channel is the word of mouth communication, the power of success stories and their diffusion among the start-up community and the ambassadors they managed to create out of their programs alumni. Even the applicants that had been rejected by the accelerator programs due to high competition, still have a strong respect for the program and advocate for it after they have been rejected. This is mainly due to the friendly communication style, the closeness and humility of the program officials.

Despite high interest, extreme popularity and exquisite openness to a selective network of business angels and venture capitalists, there is no trace of arrogance in the speech or the communication. One of the best examples we found is presented in the figure on the blog below.

Figure 19. Blog post of applicant of Y-Combinator, who got rejected.



Incubators like Y Combinator are looking for world-changing ideas, star-studded teams, or real-world traction. At the time, our fit here just wasn't right. But we did get a really nice rejection letter. Here's what Y Combinator sent us:

We're sorry to say we couldn't accept your proposal for funding. Please don't take it personally. The applications we receive get better every funding cycle, and since there's a limit on the number of startups we can interview in person, we had to turn away a lot of genuinely promising groups.

Another reason you shouldn't take this personally is that we know we make lots of mistakes. It's alarming how often the last group to make it over the threshold for interviews ends up being one that we fund. That means there are surely other good groups that fall just below the threshold and that we miss even interviewing.

http://ycombinator.com/whynot.html

We're trying to get better at this, but the hard limit on the number of interviews means it's practically certain that groups we rejected will go on to create successful startups. If you do, we'd appreciate it if you'd send us an email telling us about it; we want to learn from our mistakes.

Y Combinator Team

Applying for this opportunity was extremely exciting for both me and Leo, but we had already committed to a great product regardless of the outcome with Y Combinator. We understood that accelerator programs and funding were not going to make our product great; our success was tied to our effort and ideas.

Source: Gascoigne J., Buffer's rejected Y-Combinator application, https://open.buffer.com/buffers-y-combinator-application/, accessed on 14th of April 2016.

We formulate recommendations resulting from our thesis taking into account our thesis problems formulated, which were:

- Problem 1: Whether, and to what extent start-up accelerators in Austria, and Poland are using start-ups' oriented practices of start-up accelerators in USA?
- Problem 2: Whether, and to what extent public policy oriented on creation and performance of start-up accelerators in USA could be applied in Austria, and in Poland?
- Problem 3: Whether, and to what extent start-up accelerators and public policy oriented on creation and performance of start-ups in USA could use the best practices of Austria and Poland?

In context of thesis problem 1, for start-up accelerators located in Austria and Poland we identified that only partially they use start-ups oriented practices of start-up accelerators in USA.

Therefore we recommend considering, adapting, and reasonably implementing the following set of practices by managing teams of start-up accelerators open to embed US start-up accelerators experience:

- Run official start-up accelerator website, and be active in social media channels to minimize information asymmetry related to your program and activities of start-ups you support;
- Set up timing of the program in a way that realistically enables to develop and launch new product, or service to the market by start-up you support,
- Partner with business angels, venture capital company, or corporate partner to enable seed investments into start-ups in exchange for equity to maximize attraction of potential applicants
- Enable applying to your program for distinguished start-ups, which do not necessarily fit into your industrial, or market segment focus,
- Score higher the applicants, which demonstrate maturity in developing minimum viable product, or already own working prototype,
- Involve alumni of your program in active mentoring of future cohorts of applicants you are to accept, enable pool of mentors to grow organically, and keep it open,
- Invest into professional preparation for mentoring of your start-up accelerator's mentors to increase the impact they make. Learn more on mentor of the mentors institution,
- Share successes of start-up teams you supported. Even small successes build credibility and leave the footprint of start-ups impact, which builds their value,
- Promote your program alumni by leading dedicated section at your official website, where value proposal and contact details to the start-up are provided,
- Measure social and economic impact you made through start-up accelerator. Count job places created, new job places offered, economic investments made into start-ups nurtured, value of exits from investments. Communicate your impact to attract start-up support ecosystem stakeholders,

- Provide guidelines for applicants, which will save your time for applications screening, and assessment. Consider to equip them with business presentation template, and basic business model you expect to see at the entry, and thanks to it increase maturity of start-ups, which apply,
- Look for non-obvious start-up accelerators locations with unexplored supply of talents, which start-up accelerator could catalyze.

In context of thesis problem 2, we identified that there is a broad field for adoption of public policy practices oriented on creation and performance of start-up accelerators in Austria, and in Poland, which takes into account US experience. Therefore we recommend considering, adapting, and reasonably implementing the following set of practices by public authorities focused on nurturing start-ups support ecosystem with particular focus on start-up accelerators:

- Popularize start-up accelerator's phenomenon and promote scientific research on new entrepreneurship support ecosystem, including start-up accelerators. Use existing US research as reference point,
- Nurture initiatives increasing competitiveness, and therefore quality among existing start-up accelerators. Use existing US experience in creation of rankings, and competitions for start-up accelerators as reference point,
- Popularize start-up accelerator's phenomena by creating a space enabling learning-osmosis among managing teams of start-up accelerators, in form of cyclical forum, or conference,
- Popularize best practices of start-up accelerators in form of guidelines, identify and itemize start-up accelerators under your impact area, promote them as form of support for entrepreneurs within information policy you nurture,
- Use existing mechanisms enabling institutional teaming-up, and creation of impact investments by start-up accelerators using dedicated, co-financing tools of European Commission,
- Use existing mechanisms enabling clustering of start-up accelerators among European Union to promote them among start-up accelerators under your impact area.

In relation to the recommendations under address of public policy and public sector institutions we would like to point out initiatives and instruments we characterized in earlier part of our thesis. We indicated on existing asymmetry of information, which public institutions can equalize, and therefore contribute to start-up ecosystem growth. In that context of public policies we particularly recommend to take into account the following initiatives into account:

- EU call for financing of international connections between start-up accelerators under co-financing instrument Horizon 2020 - Startup Europe for Growth and Innovation Radar,
- EU Accelerators Assembly,
- Micro-Grants for start-ups,
- Practical guide to doing business in Europe.

In context of thesis problem 3, we identified that there is a field for both adoption of start-up accelerator practices, and public policy practices oriented on creation and performance of start-up accelerators in US, which takes into account Austrian, and Polish experience. Therefore we recommend considering, adapting, and reasonably implementing the following set of practices by start-up accelerators, and public authorities focused on nurturing start-ups support ecosystem:

- Popularize the best practices of start-up accelerators in form of guidelines, identify and itemize start-up accelerators under your impact area, promote them as form of support for entrepreneurs within information policy you nurture (as in relation to Austrian and Polish start-up accelerators),
- Open your start-up acceleration programs toward defined social groups, and minorities, incl. women, young entrepreneurs, social entrepreneurs to increase diversity of portfolio of start-ups supported,
- Affiliate and derive from resources offered by local education institutions, incl. academia,
- Balance, and simplify complexity of the application process, in order to attract the start-ups,

- Provide contact details, or communication approach enabling other start-up accelerators managing teams, and researchers to effectively contact with you.

We believe that above instruments and initiatives could additionally become part of support portfolio of start-up accelerators in researched countries maximizing their value proposal for start-ups and final impact made. In context of scientific effects of our thesis we answered both problem 1, problem 2, and problem 3.

As a result of empirical research and investigation process basing on induction reasoning we delivered objectives formulated, which were:

- Objective 1: To identify, analyze, assess, and indicate best practices used by managing teams of USA-based start-up accelerators to start-up accelerator's teams based in Austria, and in Poland
- Objective 2: To identify, analyze, assess, and formulate possible directions of start-up ecosystem development deriving from USA for public authorities of central, regional, and local level in Austria, and in Poland.
- Objective 3: To identify, analyze, assess the best practices of start-up accelerators and public policy oriented on creation and performance of start-ups in Austria and Poland, that could be applied in USA.

Relating to mentioned definition of D. Isenberg of entrepreneurship ecosystem[83], start-up accelerators can be perceived as ''turbo engine institution'', which are supporting start-ups in their value proposal safer, and faster, but not through providing shortcuts.

We pay particular attention to the importance of start-up accelerators in view of transaction cost economics and new institutional economics we elaborated. Start-up accelerators can decrease costs of search, information, due diligence, negotiation and contracting, and therefore contribute to economic exchange with economic entities at early stage of their development.

Entrepreneurship ecosystem as *"(...) set of networked institutions (...) with the objective of aiding the entrepreneur to go through all the stages of the process of new venture development. It can be understood as a service network, where the entrepreneur is the focus of action and the measure of success",* D. Isenberg cited in Fuerlinger G., Fandl U., Funke T., The role of the state in the entrepreneurship ecosystem: insights from Germany, op. cit., p. 6.

We identified the following interdependencies between our research, and domains of entrepreneurship ecosystem developed by D. Isenberg we presented in earlier part of our thesis[84]:

- In relation to domain of accessible markets - through the networks established inside different cohorts of the start-up acceleration programs the transactional costs are decreased, and economy of scale, and economy of scope effects can expose start-ups supported to new investment opportunities. We argue, that start-up accelerators which alumni databases are well exposed, can contribute to access to markets by early stage start-ups, and bring this to particular attention of start-up accelerators we researched in Europe,
- In relation to human capital workforce – start-up accelerators are often connected with co-working spaces where part of the administrative support is shared decreasing the costs, but also increasing interactions between start-up accelerators participants. We argue that the cohorts of start-ups supported by start-up accelerators create a talent pool with potential for partnerships, and collaboration with both potential investors, and employees,
- In relation to founding and finance - many of the startups investigated were exposed at the culminate point of start-up acceleration program to a demo-day, where they could present their product, or service to potential investors and receive funding. We argue, that graduation from a reputable start-up acceleration program might act like additional certificate, or guarantee in search of traditional source of financing,
- In relation to mentors, advisors and support systems - all start-up acceleration programs we have researched in all 3 countries led wide networks of specialized mentors that could offer support to start-ups. In all examples we researched we could find a reassuring model to receive the best training through the program,
- In relation to regulatory framework and infrastructure – due to the impact on new economic entities creation, we argue that start-up accelerators shall gain on importance in national entrepreneurship ecosystem, and receive visibility, and incentives increasing effectiveness of their activity,
- In relation to education and training - all start-up accelerators we researched offered intensive training programs with extensive "learning by doing" approach,

[84]Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics, op. cit., p. 6.

and mentoring of strategic importance. We argue that start-up accelerators might become vital element in educational institution landscape of start-ups, and wider – business education,

- In relation to universities being catalysts - we recognized discussed this phenomena in start-up accelerators researched, and argue that both universities and start-up accelerators can increase their impact on economy by closer cooperation,
- In relation to cultural support – we observed that part of start-up accelerators mentioned cultural support as part of the acceleration program, and argue that start-up accelerators can encourage defined social groups to apply to diversify the landscape of emerging economic entities

In the light of the above listed reflections we conclude that start-up accelerators are a raising element of entrepreneurship ecosystem, and are becoming its lively and distinguished driver. Additionally in scientific context of our thesis we would like to point the following scientific aspects of research engagement.

- Contribution to comprehensive international literature review on entrepreneurship ecosystem, including text books, academic books, academic journals, and professional reports,
- Contribution to comprehensive overview of forms of entrepreneurship support, including start-ups,
- Contribution to broadening the context of new institutional economy, and transaction costs theory in relation to start-up accelerators activity decreasing investment risk, and shortening time to launch new products and services to the market,
- Contribution to overview of start-up support ecosystem initiatives and instruments available in European Union at the moment of our thesis finalization,
- Proving electronic audit method as non-reactive research approach for investigation of start-up accelerators and start-up support ecosystem.

We would like to recognize the following limitations of our research:

- Relatively small research sample,
- Low response rate to reactive research methods, which were surveys with managing teams of start-up accelerators and mystery stakeholder method.

As a result of above we treat our contribution to science as exploratory one, however still incrementally contributing to knowledge on phenomenon which are start-up accelerators. Phenomenon of start-up accelerators is relatively new, however we believe its significance will grow. We identify research opportunities related to phenomenon of start-up accelerators which will base on substantial research samples, higher response rate of reactive, and qualitative methods used. We recognize the following areas of research related to start-up accelerators as particularly worth engaging:

- Social and economic impact of start-up accelerators into growth of national, regional and local economy,
- Externalities, club goods benefits, and network effects created by start-up accelerators,
- Transaction costs implications of start-up accelerators on start-up investments' stakeholders,
- Evolution of start-up accelerator's business models.

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4) I5invest - http://i5invest.com/
5) Impact Hub Vienna- http://vienna.impacthub.net/program/accelerate-program/
6) INiTS Start up Camp- http://www.inits.at/en/startup-camp/
7) Kubator -http://kubator.at/en/kubator-technology-and-startup-center-gmund-contact-2/
8) SBA Research Group https://www.sba-research.org/accelerator-program/
9) Startup Live Vienna - http://www.startuplive.org/about/
10) What a Venture - https://www.whataventure.com/industryaccelerator/

Start-up accelerators located in Poland:

11) Alfa Pre –accelerator Program - http://alfa.ac/

12) Alfabeat Accelerator - http://www.alfabeat.pl/
13) Gamma Rebels Accelerator - http://hardgamma.com/gammarebels/
14) Huge Thing Acceleration Program http://hugething.vc/
15) Innovation Nest - http://www.innovationnest.co/, and also http://growth.innovationnest.co/
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Appendice

Appendix 1 - questionnaire and results of electronic audit

Country:			
Name of start-up accelerator:			
Contact details (e-mail to management):			
Block I - Information related to the nature of the start-up acceleration programme resulting from classic definition of start-up accelerator (Cohen and Hohberg, 2012)			
No.	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Scoring method	Detailed qualitative comment of researcher
1	Duration of start-up accelerator's program is indicated (e.g. n-weeks/months for entities qualified)	Yes -1/ No - 0	
2	Business model of start-up acceleration program is either investment (investing equity in selected start-ups accepted to the start-up acceleration program), or non-profit	Yes -1/ No - 0	
3	Venture stage of start-ups looked for in recruitment/selection is early stage	Yes -1/ No - 0	
5	Education offered within the program is basing on seminars/workshops, and has continuous character	Yes -1/ No - 0	
6	Mentorship offered for participants of start-up accelerator's is intense, and delivered by start-up accelerators employees, and or by external mentors	Yes -1/ No – 0	
Maximum score within the Block I		5	
Block II - Information related to start-up acceleration economic and social impact			
No.	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Scoring method	Detailed qualitative comment of researcher

1	Start-up accelerator disclose the information about its foundation source enabling its activity (private investors, public sector investment, non-profit organization investment)	Yes -1/ No – 0	
2	Start-up accelerator indicates start-ups supported, and or their success-stories	Yes -1/ No - 0	
3	Start-up accelerator measures impact of their graduates, and provides information job-places created and revenue generated by start-ups, who were supported by start-up accelerator	Yes -1/ No - 0	
4	Start-up accelerator is openly stating information about the mentors and their professional activity	Yes -1/ No - 0	
5	Start-up accelerator is openly stating information about the mentors and their professional activity	Yes -1/ No – 0	
6	Start-up accelerator is opened for new mentors by encouragement for submitting expression of interest for mentoring	Yes -1/ No – 0	
Maximum score within the Block II		5	
Block III - Information related to the application process			
No.	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Scoring method	Detailed qualitative comment of researcher
1	Start-up accelerator uses own, unique practice within start-up accelerator's program, not typical for classic definition of start-up accelerator (Cohen, Hochberg, 2012)	Yes -1/ No - 0	
2	Online application process possible	Yes -1/ No – 0	
3	Start-up accelerator is openly expressing the criteria and weight of the points in the evaluation process	Yes -1/ No - 0	
4	Start-up accelerator is defining clearly the industry segment which it supports	Yes -1/ No - 0	
5	Start-up accelerator has an online database accessible to public with all the	Yes -1/ No - 0	

	participants		
6	Start-up accelerator has a blog or a newsletter to keep the members up to date with interesting topics	Yes -1/ No – 0	
7	Start-up accelerator has a preference or cohort to support minorities in business (foreigners, women, people with disabilities, young graduates, etc.)	Yes -1/ No - 0	
Maximum score within the Block III		7	

Electronic audit results – subpopulation of start-up accelerators in Austria

Identification data						Block I						Block II						Block III								
No.	Name of Start-up Accelerator	Location	No. of inhabitants for 31st of Dec 2014	Website address	Date of electronic audit - dd-mm-yyyy	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Duration of start-up accelerator's programme is indicated (e.g. n-weeks/months for entities qualified)	Business model of start-up acceleration programme is either investment (investing equity in selected start-ups accepted to the start-up acceleration programme), or non-profit	Venture stage of start-ups looked for in recruitment/selection is early stage	Education offered within the programme is basing on seminars/workshops, and has continuous character	Mentorship offered for participants of start-up accelerator's is intense, and delivered by start-up accelerators employees, and or by external mentors	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Start-up accelerator disclose the information about its foundation source enabling its activity (private investors, public sector investment, non-profit organization investment)	Start-up accelerator indicates start-ups supported, and or their success-stories	Start-up accelerator measures impact of their graduates, and provides information job-places created and revenue generated by start-ups, who were supported by start-up accelerator	Start-up accelerator is openly stating information about the mentors and their professional activity	Start-up accelerator is opened for new mentors by encouragement for submitting expression of interest for mentoring	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Start-up accelerator uses own, unique practice within start-up accelerator's programme, not typical for classic definition of start-up accelerator (Cohen, Hochberg, 2012)	Online application process is possible	Start-up accelerator is openly expressing the criteria and weight of the points in the evaluation process	Start-up accelerator is defining clearly the industry segment which it supports	Start-up accelerator has an online database accessible to public with all the participants	Start-up accelerator has a blog or a newsletter to keep the members up to date with interesting topics (ex start date)	Start-up accelerator has a preference or cohort to support minorities in business (foreigners, women, people with disabilities, young graduates, etc)	TOTAL
1	INITS	Vienna	1826030	http://www.inits.at/en/startup-camp/	2016-02-01	Block I	1	1	1	1	1	Block II	1	1	1	1	0	Block III	1	1	0	0	1	1	0	13
2	Impact Hub Vienna	Vienna	1826030	http://vienna.impacthub.net/program/accelerate-program/	2016-02-01	Block I	1	1	1	1	1	Block II	1	1	0	0	1	Block III	1	1	0	0	1	1	1	13
3	What a Venture	Vienna	1826030	https://www.whataventure.com/industryaccelerator/	2016-02-02	Block I	1	1	1	1	1	Block II	1	0	0	1	0	Block III	1	1	0	1	0	1	0	11
4	SBA Research Accelarator	Vienna	1826030	https://www.sba-research.org/accelerator-program/	2016-02-02	Block I	0	1	1	0	1	Block II	1	0	0	0	0	Block III	0	1	0	1	0	0	0	6
5	I5 Invest	Vienna	1826030	http://i5invest.com/	2016-02-01	Block I	0	1	0	0	1	Block II	1	1	0	1	0	Block III	0	0	0	1	1	0	0	7
6	Berndorf	Berndorf	8898	https://www.f6s.com/berndorfbandbusinessaccelerator	2016-02-01	Block I	1	1	1	1	1	Block II	1	0	0	1	0	Block III	0	1	0	1	0	0	0	9
7	Kubator	Gmünd	5324	technology-and-startup-center-gmund-contact-2/	2016-02-01	Block I	1	1	1	1	1	Block II	0	0	0	0	0	Block III	1	1	0	1	0	0	0	8
8	Segment Accelarator	Vienna	1826030	https://www.f6s.com/segmentsaccelerator2015/apply	2016-02-02	Block I	1	1	1	1	1	Block II	1	1	0	0	0	Block III	0	1	1	0	1	1	0	11
9	Build	Klagenfurt	95450	https://www.f6s.com/build/about	2016-02-02	Block I	1	1	1	1	1	Block II	1	1	0	1	0	Block III	0	1	0	1	1	1	0	12
10	Start UP live	Vienna	1826030	http://www.startuplive.org/about/	2016-02-02	Block I	1	1	1	1	1	Block II	0	1	0	1	0	Block III	1	1	0	1	1	1	0	12
	TOTALS						8	10	9	8	10		8	6	1	6	1		5	9	1	7	6	6	1	102

Electronic audit results – subpopulation of start-up accelerators in Poland

Identification data						Block I						Block II						Block III								
No.	Name of Start-up Accelerator	Location	No. of inhabitants for 31st of Dec 2014	Website address	Date of electronic audit - dd-mm-yyyy	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Duration of start-up accelerator's programme is indicated (e.g. n-weeks/months for entities qualified)	Business model of start-up acceleration programme is either investment (investing equity in selected start-ups accepted to the start-up acceleration programme), or non-profit	Venture stage of start-ups looked for in recruitment/selection is early stage	Education offered within the programme is basing on seminars/workshops, and has continuous character	Mentorship offered for participants of start-up accelerator's is intense, and delivered by start-up accelerators employees, and or by external mentors	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Start-up accelerator disclose the information about its foundation source enabling its activity (private investors, public sector investment, non-profit organization investment)	Start-up accelerator indicates start-ups supported, and or their success-stories	Start-up accelerator measures impact of their graduates, and provides information job-places created and revenue generated by start-ups, who were supported by start-up accelerator	Start-up accelerator is openly stating information about the mentors and their professional activity	Start-up accelerator is opened for new mentors by encouragement for submitting expression of interest for mentoring	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Start-up accelerator uses own, unique practice within start-up accelerator's programme, not typical for classic definition of start-up accelerator (Cohen, Hochberg, 2012)	Online application process is possible	Start-up accelerator is openly expressing the criteria and weight of the points in the evaluation process	Start-up accelerator is defining clearly the industry segment which it supports	Start-up accelerator has an online database accessible to public with all the participants	Start-up accelerator has a blog or a newsletter to keep the members up to date with interesting topics (ex start date)	Start-up accelerator has a preference or cohort to support minorities in business (foreigners, women, people with disabilities, young graduates, etc)	TOTAL
1	Alfa AC	Warsaw	1729119	http://alfa.ac/	26-01-2016	Block I	1	1	1	1	1	Block II	1	1	0	1	0	Block III	1	0	0	1	0	1	1	12
2	Warsaw Accelerator	Warsaw	1729119	http://waw.ac/	26-01-2016	Block I	1	1	1	1	1	Block II	1	1	1	1	0	Block III	1	0	0	1	0	1	1	13
3	Innovation Nest	Warsaw	1729119	http://www.innovationnest.co/, and also http://growth.innovationn	1-02-2016	Block I	1	1	0	1	1	Block II	0	0	0	1	0	Block III	1	0	0	1	1	1	0	9
4	Huge Thing	Poznan	545680	http://hugething.vc/	02-02-2016	Block I	1	1	0	1	1	Block II	1	0	1	1	0	Block III	1	0	0	1	1	1	0	11
5	Orange Fab Polska	Warsaw	1729119	http://orangefab.pl/	04-02-2016	Block I	1	1	0	1	1	Block II	1	1	0	1	0	Block III	1	1	1	1	1	1	0	13
6	Scale	Torun	203158	http://www.scale.smartspace.io/	05-02-2016	Block I	1	1	1	1	1	Block II	1	0	0	1	0	Block III	1	0	0	1	0	1	0	10
7	MIT Enterprise Forum Poland	Warsaw	1729119	http://mitefpoland.org/	05-02-2016	Block I	1	0	1	1	1	Block II	1	0	0	0	1	Block III	1	0	0	1		1	1	9
8	hub:raum Krakow WARP	Krakow	761837	https://www.hubraum.com/programs/warp-accelerator-krakow	05-02-2016	Block I	1		1	1	1	Block II	1	1	0	1	0	Block III	1	1	0	1	1	0	1	12
9	Gamma Rebels	Warsaw	1729119	http://hardgamma.com/gammarebels/	05-02-2016	Block I	1	1	1	0	1	Block II	1	0	0	0	0	Block III	1	0	0	1	0	1	0	8
10	Alfabeat	Gdansk	461489	http://www.alfabeat.pl/	05-02-2016	Block I	0	1	1	0	1	Block II	0	1		0	0	Block III	1	1	0	1	0	1	0	8
	TOTALS						9	8	7	8	10		8	5	2	7	1		10	3	1	10	4	9	4	105

Electronic audit results – subpopulation of start-up accelerators in US

Identification data						Block I						Block II						Block III								
No.	Name of Start-up Accelerator	Location	No. of inhabitants for 31st of Dec 2014	Website address	Date of electronic audit - dd-mm-yyyy	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Duration of start-up accelerator's programme is indicated (e.g. n-weeks/months for entities qualified)	Business model of start-up acceleration programme is either investment (investing equity in selected start-ups accepted to the start-up acceleration programme), or non-profit	Venture stage of start-ups looked for in recruitment/selection is early stage	Education offered within the programme is basing on seminars/workshops, and has continuous character	Mentorship offered for participants of start-up accelerator's is intense, and delivered by start-up accelerators employees, and or by external mentors	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Start-up accelerator disclose the information about its foundation source enabling its activity (private investors, public sector investment, non-profit organization investment)	Start-up accelerator indicates start-ups supported, and or their success-stories	Start-up accelerator measures impact of their graduates, and provides information job-places created and revenue generated by start-ups, who were supported by start-up accelerator	Start-up accelerator is openly stating information about the mentors and their professional activity	Start-up accelerator is opened for new mentors by encouragement for submitting expression of interest for mentoring	Aspect of start-up accelerator activity researched wit method of electronic audit of official website of the start-up accelerator	Comment	Online application process is possible	Start-up accelerator is openly expressing the criteria and weight of the points in the evaluation process	Start-up accelerator is defining clearly the industry segment which it supports	Start-up accelerator has an online database accessible to public with all the participants	Start-up accelerator has a blog or a newsletter to keep the members up to date with interesting topics (ex start date)	Start-up accelerator has a preference or cohort to support minorities in business (foreigners, women, people with disabilities, young graduates, etc)	TOTAL
1	AngelPad	San Francisco, NYC	na	http://angelpad.org/	2016-02-05	Block I	1	1	1	1	1	Block II	1	1	0	1	1	1	Block III	1	0	1	0	1	0	13
2	MuckerLab	Los Angeles	3,862,839	http://www.muckercapital.com/muckerlab/about/	2016-02-05	Block I	1	1	1	1	1	Block II	1	0	1	0	0	1	Block III	1	1	1	0	1	1	13
3	Techstars	Various	na	http://www.techstars.com/startup-accelerator/	2016-02-05	Block I	1	1	1	1	1	Block II	1	1	1	1	0	0	Block III	1	0	1	1	1	0	13
4	New Venture Challenge	Chicago	2722400	http://research.chicagobooth.edu/nvc	2016-02-06	Block I	1	1	1	1	1	Block II	1	1	1	1	0	0	Block III	1	1	1	1	1	1	15
5	The Alchemist Accelarator	Santa Clara	1894600	http://alchemistaccelerator.com/	2016-02-06	Block I	1	1	1	1	1	Block II	1	1	1	1	1	1	Block III	1	1	1	1	1	1	17
6	Start X	Palo Alto	9099	http://startx.com/	05-02-2016	Block I	0	1	1	1	1	Block II	1	1	1	1	1	0	Block III	1	0	1	1	1	1	15
7	Amplify	Los Angeles	3862839	http://amplify.la/	05-02-2016	Block I	1	1	1	1	1	Block II	0	0	1	0	0	0	Block III	1	0	0	1	1	0	10
8	500	Mountain View	79378	http://500.co/	05-02-2016	Block I	1	1	1	1	1	Block II	1	1	0	1	0	1	Block III	1		0	1	1	0	13
9	Capital Innovators	St Louis	317419	http://capitalinnovators.com/	05-02-2016	Block I	1	1	1	1	1	Block II	1	0	0	1	0	0	Block III	0	0	1	1	1	0	11
10	DreamIT Ventures	Various	N/A	http://dreamit.com/	06-02-2016	Block I	1	1	1	1	1	Block II	1	0	0	1	1	1	Block III	0	0	1	1	1	0	13
TOTALS							9	10	10	10	10		9	6	6	8	4	5		8	3	8	8	10	4	133

Appendix 2 – questionnaire of survey with managing teams of start-up accelerators and information on responses

To the attention of Managing Team of (…)

Dear Representative of Managing Team at (…),

we find the activity of your start-up accelerator distinguishing, and therefore we have decided to take
a deep dive into it and explore in the research on start-up accelerators ecosystem we conduct at WU Executive Academy in Austria.

Objective of our research is to identify challenges that accelerators face as organizations in United States, Austria and Poland.

This short survey will complement other research methods we have been using in our study.

Our study aims to support decision makers in creating of better conditions for creation and support of start-up accelerators, as new form of national entrepreneurship support ecosystems.

In that context we turn to you, to share your opinion on 10 questions listed below, which will take up to 20 minutes to respond.

We heavily appreciate the time you dedicate into this, as we know that the agenda for start-up accelerator leaders is unpredictable and endless.

We kindly ask you to share your inputs in form attached below, and send them back to tomasz.pilewicz@s.wu.ac.at no later than 10th of April 2016.

Once our research is finished, upon request we will share a study presenting best practices in start-up accelerators community, their interactions with government and private sector in terms of leveraging success ratio of start-ups nurtured.

Should you have any questions please don't hesitate to contact either me or my research fellow.

With very best regards, and kindest ask for your support,

Tomasz Pilewicz, and Cristina Maria

Research survey:

1. Is there a definition of a start-up accelerator you use, and could recommend for entrepreneurship ecosystem stakeholders? If yes, please share with us the definition you use, and particularly recommend:

……
……

2. What was the most important factor deciding on creation of your start-up accelerator?

……
……

3. Whether and to what extent have national, regional, and/or local public authorities been engaged into financing of your start-up accelerator (pls. also include favorable taxing rules, if any)?

……
……

4. Whether and to what extent have you cooperated with national, regional, and/or local public authorities in non-financial basis (e.g. patronage, promotion, judges, mentors, other)?

……
……

5. To what extent does success of start-ups recruited for your acceleration program depends on the quality of the mentors you provide them with?

……
……

6. If you compete with other start-up accelerators in the dimension of attraction of new start-ups, what are key distinguishing characteristics impacting unique offer of your start-up accelerator?

……
……

7. Whether and to what operational model is your start-up accelerator evolving (incl. maintaining its current model, evolving into venture incubator, seed fund, other form):

……
……

8. Is there any start-up accelerator you consider as role model, or distinguishing in some aspects that you learn from ? If yes, please share with us its distinguishing details and aspects:

……
……

9. To what extent do you think that the accelerator ecosystem is fostering emergence of so called unicorns (private companies valued at USD 1 bln or more) to the market?

……
……

10. Do you collaborate with start-ups or start-up accelerators in Europe? If so, whether and what exact barriers do you indicate as diminishing collaboration with a start-ups, or a start-up accelerators in Europe?

……
……

Thank you for your contribution,

Tomasz Pilewicz, and Cristina Maria

Information on responses to survey with managing teams of start-up accelerators

No.	Electronic address of start-up accelerator managing team representative found in the public domain and used in the research	Response to survey in time of research
1	(*alias disclosed to information of researchers*) @speedupgroup.com	Yes
2	(*alias disclosed to information of researchers*) @fpt.org.pl	Yes
3	(*alias disclosed to information of researchers*) @impacthub.net	No
4	(*alias disclosed to information of researchers*) @impacthub.net	No
5	(*alias disclosed to information of researchers*) @whataventure.com	No
6	(*alias disclosed to information of researchers*) @sba-research.org	No
7	(*alias disclosed to information of researchers*) @i5invest.com	No
8	(*alias disclosed to information of researchers*) @berndorf.co.at	No
9	(*alias disclosed to information of researchers*) @kubator.at	No
10	(*alias disclosed to information of researchers*) @build.or.at;	No
11	(*alias disclosed to information of researchers*) @startuplive.org	No
12	(*alias disclosed to information of researchers*) @speedupgroup.com	No
13	(*alias disclosed to information of researchers*) @waw.ac	No
14	(*alias disclosed to information of researchers*) @waw.ac	No
15	(*alias disclosed to information of researchers*) @innovationnest.co	No

16	(*alias disclosed to information of researchers*) @inits.at	No
17	(*alias disclosed to information of researchers*) @exea.pl	No
18	(*alias disclosed to information of researchers*) @hubraum.com	No
19	(*alias disclosed to information of researchers*) @hardgamma.com	No
20	(*alias disclosed to information of researchers*) @alfabeat.pl	No
21	(*alias disclosed to information of researchers*) @muckercapital.com	No
22	(*alias disclosed to information of researchers*) @chicagobooth.edu	No
23	(*alias disclosed to information of researchers*) @capitalinnovators.com	No
24	(*alias disclosed to information of researchers*) @dreamit.com	No

Appendix 3 - questionnaire of mystery stakeholder method research sent to managing teams of start-up accelerators and information on responses

Dear Startups Accelerator Management Team,

I represent a start-up working on technology absorbing light energy more effectively than current, popular materials which is flexible, transparent and light in terms of weight quality.

Initially we recognize such fields of this technology applications as sun energy absorption for energy production incl. covering surfaces of buildings (market of low-emission constructions), or cars (market of electronic vehicles) , or mobile devices (market of charging devices).

Our technology has been filed for patent protection. Our team consists mainly of engineers. So far we've been bootstrapping our idea development.

We'd like to explore other, possibly promising fields of our technology applications, work out road to the market and scaling up model, possibly with support of small seed financing.

In that context I was wondering whether we initially fit into your acceleration program, and whether you have any examples of supported endeavors of similar nature we could find as valuable in terms of our acceleration and mentoring journey?

Please let me know whether you recognize initial fitness of our idea to your program, and support possibilities.

If possible, please advise from your experience what level of engagement and development opportunities we could become part of in your program.

If we do not fit, please be kind to advise us on start-up accelerator of your recommendation we could consider, and refer to as recommended.

On behalf of (*disclosed to information of researchers)* , and with warm regards (*disclosed to information of researchers)*

Information on responses to mystery stakeholder method research sent to managing teams of start-up accelerators

No.	Electronic address of start-up accelerator managing team representative found in the public domain and used in the research	Response to survey in time of research
1	(*alias disclosed to information of researchers*) @inits.at	Yes
2	(*alias disclosed to information of researchers*) @inits.at	Yes
3	(*alias disclosed to information of researchers*) @whataventure.com	Yes
4	(*alias disclosed to information of researchers*) @berndorf.co.at	Yes
5	(*alias disclosed to information of researchers*) @waw.ac	Yes
6	(*alias disclosed to information of researchers*) @alfabeat.pl	Yes
7	(*alias disclosed to information of researchers*) @impacthub.net	No
8	(*alias disclosed to information of researchers*) @impacthub.net	No
9	(*alias disclosed to information of researchers*) @sba-research.org	No
10	(*alias disclosed to information of researchers*) @i5invest.com	No
11	(*alias disclosed to information of researchers*) @kubator.at	No
12	(*alias disclosed to information of researchers*) @build.or.at;	No
13	(*alias disclosed to information of researchers*) @startuplive.org	No
14	(*alias disclosed to information of researchers*) @speedupgroup.com	No
15	(*alias disclosed to information of researchers*) @waw.ac	No
16	(*alias disclosed to information of researchers*) @innovationnest.co	No
17	(*alias disclosed to information of researchers*) @speedupgroup.com	No
18	(*alias disclosed to information of researchers*) @exea.pl	No
19	(*alias disclosed to information of researchers*) @fpt.org.pl	No
20	(*alias disclosed to information of researchers*) @hubraum.com	No
21	(*alias disclosed to information of researchers*) @hardgamma.com	No
22	(*alias disclosed to information of researchers*) @muckercapital.com	No
23	(*alias disclosed to information of researchers*) @chicagobooth.edu	No
24	(*alias disclosed to information of researchers*) @capitalinnovators.com	No
25	(*alias disclosed to information of researchers*) @dreamit.com	No