



Hochschule für Angewandte Wissenschaften Hamburg
Hamburg University of Applied Sciences

Master Thesis

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Hamburg's Entrepreneurial Ecosystem And The
Next Media Initiative

Public Policy Towards Entrepreneurship

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The Next Media Initiative

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Abstract

Entrepreneurship, more specifically the formation of tech startups, is often attributed with economic growth and job creation due to their high-growth potential by many policy makers around the world. This link is widely debated in scientific literature, which does not necessarily seem to inform public policy. The City of Hamburg established a Next Media Initiative, focusing on media and IT industry related innovation to nurture the future development of this industry cluster with the help of high-growth ventures. This master thesis explores the composition of Hamburg's entrepreneurial ecosystem, local government efforts to facilitate its development and the (dis)connect between municipal innovation policy and academic literature.

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Kurzzusammenfassung

Unternehmertum (Entrepreneurship), insbesondere die Gründung von Tech Startups, wird aufgrund des enormen Wachstumspotentials solcher Unternehmen von vielen Politikern weltweit oft mit Wirtschaftswachstum und der Schaffung von Arbeitsplätzen verbunden. Diese Verknüpfung wird in der wissenschaftlichen Literatur umfassend diskutiert, wissenschaftliche Erkenntnisse fließen aber nicht zwingend in die Entwicklung politischer Strategien zur Wirtschaftsförderung ein. Die Freie und Hansestadt Hamburg hat eine Next Media Initiative gegründet, welche mit einem starken Fokus auf die Medien- und IT-Branche die Entwicklung dieses Wirtschafts-Clusters fördert, insbesondere mit Hilfe von Startups mit hohem Wachstumspotential (high-growth ventures). Diese Masterarbeit untersucht die Zusammensetzung des Startup-Ökosystems (entrepreneurial ecosystem) in Hamburg, die Bemühungen der lokalen Verwaltung dessen Entwicklung zu fördern und Deckung der regionalen Innovationspolitik mit wissenschaftlicher Literatur.

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1 Abstract

Introduction:

Entrepreneurship, more specifically the formation of tech startups, is often attributed with economic growth and job creation due to their high-growth potential by many policy makers in the world. This link is widely debated in scientific literature, which does not necessarily seem to inform public policy. The City of Hamburg established a Next Media Initiative - nextMedia.Hamburg - in 2014, focusing on media/IT industry related innovation to nurture the future development of this industry cluster with the help of high growth ventures.

This master thesis explores the composition of Hamburg's entrepreneurial ecosystem, local government efforts to facilitate its development and the (dis)connect between municipal innovation policy and academic literature.

Method:

With its nextMedia.Hamburg initiative within the media/IT industry cluster, the City of Hamburg aims to support the entrepreneurial ecosystem as well as the media and creative industry in general. In various official documents and on a dedicated nextMedia.Hamburg website the efforts to nurture innovation, to create more ventures and maintain Hamburg as a media industry capital are published. This thesis will introduce the local entrepreneurial ecosystem along with its most relevant stakeholders and review the regional innovation strategy and nextMedia.Hamburg initiative in 3 parts.

Taking into consideration the current setup of Hamburg's entrepreneurial ecosystem and its various entities, the first part will summarise salient points of the innovation strategy outlined by the City of Hamburg as well as key elements of the nextMedia.Hamburg initiative's activities by which the regional government aims to attain its goals.

The second part takes relevant aspects of the outlined strategy and activities and reviews them from an academic perspective, considering arguments presented by Shane (2009), Audio et al. (2007), Morris et al. (2015), and Brown & Mawson (2015).

The third part draws on research findings to classify the outlined policy agenda and its measures to support the entrepreneurial ecosystem in Hamburg and discusses them in regards to Regional Innovation Systems (RIS) analysed by Moutinho et al. (2015) and the Triple Helix Approach (Ranga and Etzkowitz 2016) to assess their possible impact on the entrepreneurial ecosystem in Hamburg.

Results:

This thesis makes 4 contributions. Foremost, several disconnects between local entrepreneurship policy in Hamburg and academic literature on entrepreneurship policy are explored by analysing both the regional innovation strategy and nextMedia.Hamburg initiative's documents and activities. Additionally it is shown how relevant scientific findings have not been taken into consideration despite collaboration with research facilities at local universities. Third, it is illustrated how the activities to nurture entrepreneurial activity by the nextMedia.Hamburg initiative lack a connection to actionable metrics to successfully measure results and adapt for change. As a fourth contribution, this thesis draws on common challenges in developing regional entrepreneurship policy and proposes closer collaboration between the research community, industry and policy makers.

2 Introduction & Definitions

This thesis explores complex interrelations between startups, the entrepreneurial ecosystem in which they exist and regional public policy towards entrepreneurship in Hamburg, Germany. Although certain aspects discussed throughout the document about startups and entrepreneurial ecosystems might be generic and could be applied to any other region in the world, the analysis of Hamburg's regional public policy towards entrepreneurship is location specific, regardless of similarities to other regions.

For the purpose of the research in this thesis it is prudent to introduce and define specific terms in regards to their usage throughout the document. Especially in the context of entrepreneurship and innovative potentials of high-growth ventures, many different definitions for terms such as startups or ecosystems are used and in fact often misused as buzzwords in various types of publications, ranging from scientific journals, newspaper articles and publicly available government documents to tv documentations and internet publications of any kind.

Since some of the terms are relatively new in terms of academic research, the attempted definitions are meant to be up-to-date at the time of the thesis' composition and in accordance with current academic literature.

2.1 Startup

The term "startup" is used generically as a synonym for entrepreneurial activities across many forms of businesses and especially to describe young, new businesses ever since the dot-com-bubble in 2000 (Recke 2015). In recent years, startups have been attributed with being a driving force behind economic growth and job creation by many policy makers and industry advocates around the world (Reynolds et al. 2000, Shane 2009, Kane 2010). Therefore a differentiated approach to classify entrepreneurial activities is necessary.

To distinguish between regular entrepreneurial activities and those that might in fact entail a potential for the creation of economic wealth, a startup can be defined as an innovative company, trying to develop a scalable business model that can be replicated repeatedly (Blank 2012). In addition these startups can be characterised by being young businesses (Brettel et al. 2008), having low initial capital funds and taking high risks to establish their innovative business ideas (Graham 2005).

Most importantly, these businesses are growth oriented (Warmer & Weber 2014) and are often called high-growth ventures (Shane 2009, Morris et al. 2015, Mason & Brown 2013). High-growth ventures are very different from any other kind of newly founded firm, since their chance of failing is about 75% even if its business idea, team and product are good enough to secure venture capital financing (Blank 2013).

Therefore a scalable business model is the most relevant aspect for growth oriented startups and needs to be verified in regards to its potential for success at the lowest financial expense (Kollmann 2011). This is a challenging process during which the startup, its structure and financial needs change dramatically and repeatedly. During its lifetime a startup requires very different types of funding, ranging from initial seed capital funding to high volume venture capital financing (Ripsas 1997).

Startup stages

Startups may evolve very dynamically and can be categorised in 5 distinct stages of development according to “Deutscher Startup Monitor”, initiated by the Bundesverband Deutsche Startups (e.V.). These stages are “seed stage”, “startup stage”, “growth stage”, “later stage” and “steady stage” (Ripsas & Tröger 2014).

The “seed stage” is a conceptional stage in which the startup is experimenting with its product and business model to reach a market fit. Within the “startup stage” the company has a working product and generates first revenues or signs up users. In the “growth stage” the company is characterised by a matured product and high growth (also known as scaling). During the “later stage” the business might plan to sell or aim for a stock exchange IPO whereas the “steady stage” is a phase of stagnation (Kohlmann 2011, Ripsas 1997). Additionally there are an “idea stage” and a “co-founder stage” (see fig. 1) described by Vital (2013), which are important to note in order to understand concepts behind startup funding (Recke 2015).

Startup funding

During its distinct stages of development, a startup requires different types of funding, which can ruffly be divided in “seed round”, “angel round” and “series A round” (Graham 2005). There are other terms used for these stages, e.g. by Vital (2013) and there might be additional rounds of funding, still they all fit into one of the above categories.

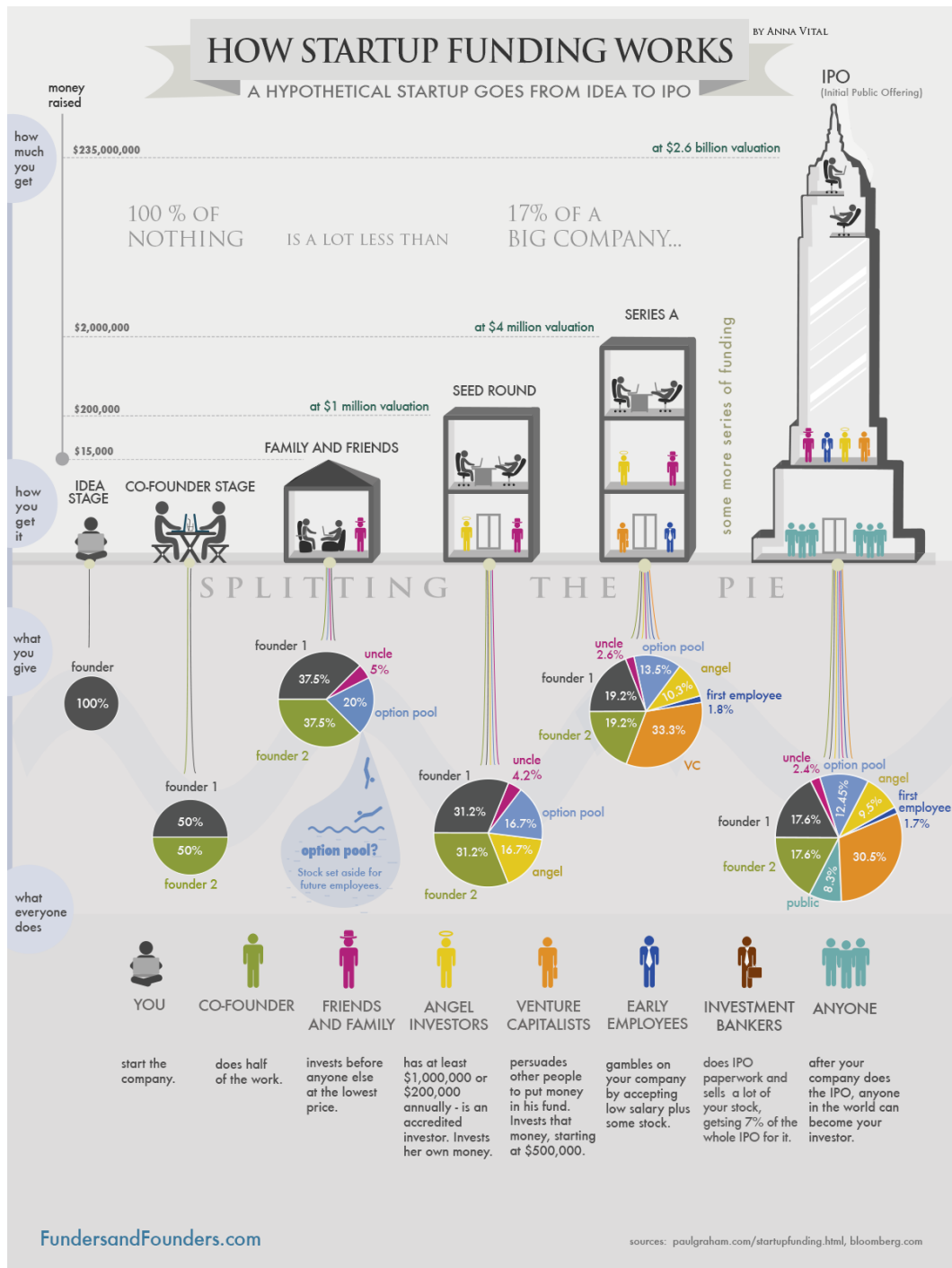


Figure 1: How Startup Funding Works

Smallest rounds of funding before an actual “seed sound” might be called “pre-seed investment” or something similar. Although they might have impact on equity shares within the business and are of relevance for startup formation, they are not that different from a “seed round” in regards to requirements in terms of scope, size and volume of the investment. Therefore, Graham (2005) does not distinguish between different types of “seed round” funding and considers them structurally comparable.

A “seed round“ can be attributed to the “seed stage” of a startup and might come from the entrepreneurs’ private funds or investors such as family & friends, public subsidies or as part of an accelerator program. The investment usually ranges between a 5-digit and small 6-digit sum and involves giving small equity shares to the investors (Recke 2015). Accelerator programs are the most professional forms of investments at this stage. They provide initial funding during a timed program of usually 3-6 months to prepare the startup for the next round of financing in exchange for 3-10% in equity. In addition they provide access to office space, coaching, industry insights and workshops for the founding team. Lastly they expect the startup to leave the accelerator after finishing the program, hopefully with prospects of additional funding (Altman 2014, Springer 2015, NMA 2016).

An other alternative is receiving subsidies or investments from public funds. These can be divided in grants, aids, investments and non-cash benefits and are available on regional, national and international levels (FÜR-GRÜNDER.DE 2015). These types of funding will be discussed in greater detail later on.

If a startup manages to obtain a “seed round”, it leaves the “idea stage” and “co-founder stage” mentioned by Vital (2013) and evolves into the “seed stage” in terms of the “Deutsche Startup Monitor” (Ripsas & Tröger 2014).

An “angel round” is typically linked to the “startup stage” and is usually done with business angels (also called angel investors), who invest their own money, or seed funding companies, often called incubators or company builders. It involves higher investment sums in the 6-digit to low 7-digit range and larger equity shares for the investors (Recke 2015). Incubators can be compared with accelerators but in addition to higher investments and larger equity shares, they also provide more operational support in building up the company, e.g. with dedicated development or marketing teams. Startups remain within an incubator for longer periods of time, ranging from 1 to 5 years (Cohen 2013).

Additional means of financing during this stage might be crowd-funding and crowd-investing through various national or international platforms which became quite popular over the past years (Recke 2015).

If a startup manages to obtain an “angel round”, it evolves to the “startup stage” in terms of the “Deutsche Startup Monitor” (Ripsas & Tröger 2014).

A “series A round” or any subsequent investment round after that (called “series B round”, “series C round” etc.) is meant for the “growth stage” during which the startup scales towards an potential acquisition or an IPO. It is typically done by specialised venture capital investors, investing large amounts of money through their managed funds and acquiring equity shares of usually more than 33% to accelerate the growth of the business (Recke 2015).

If growth criteria are met, subsequent rounds of funding might be attributed to the “later stage” and can involve large private equity firms or investment banks in addition to venture capital investors. The ultimate goal in terms of funding is an acquisition or an IPO, often referred to as an Exit, during which the shareholders can liquidate their equity shares at an ideally lucrative price (Graham 2005).

The “steady stage” as a stage of stagnation is not discussed in more detail since it does not entail firm growth and usually no substantial additional rounds of funding.

Startup lifecycle

The lifecycle of a startup with high-growth potential can be described as a process of continuously changing shareholder structure (see fig. 2). This is necessary to facilitate the distinct kinds of investments at different levels of risk to achieve the exponential growth (scaling) characteristic for a high-growth startup (Recke 2015).

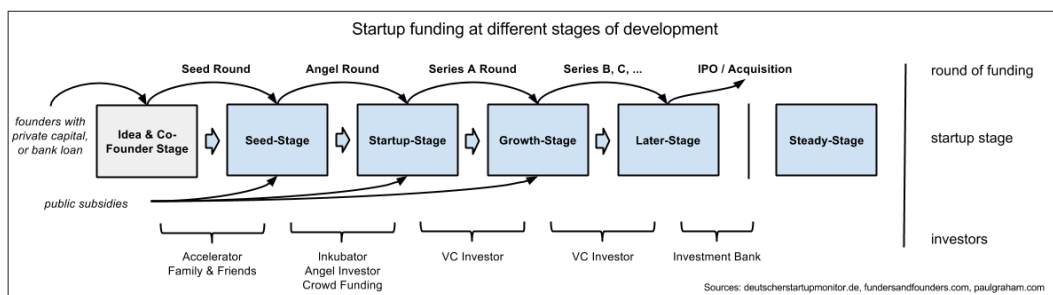


Figure 2: Startup funding at different stages of development

Taking all these aspects into consideration, startups - or more specifically high-growth ventures - can be characterised as follows in regards to this thesis:

- newly established businesses with high-growth potential
- trying to establish an innovative, scalable business model
- having low initial capital, requiring high risk financing to scale

2.2 Entrepreneurial Ecosystem

The entrepreneurial ecosystem (often called startup ecosystem) approach is a rather recent way to describe interrelations between startup communities and regional parameters. One of the first researchers in this field is Isenberg (2010), who stipulated that specific measures to foster the local startup economy must be aligned to regional characteristics in order to be successful. The approach focuses on high-growth ventures, meaning startups with potential for innovation, economic growth and job creation (Mason & Brown 2014, World Economic Forum 2013), therefore excluding any and all other kinds of entrepreneurship, such as self employment or regular small business formations.

The main concept behind this approach draws on entrepreneurial activities being linked to a community of different actors, strongly emphasising social contexts to hinder or foster entrepreneurship (Stam 2015, Ács et al. 2014). Although no evidence for improved success rates of each startup within a thriving entrepreneurial ecosystems can be found, a healthy ecosystem arguably produces larger numbers of startups and therefore larger numbers of successful high-growth ventures in that region (Compass 2015).

As many other concepts - e.g. clusters or innovation systems - the entrepreneurial ecosystem approach focuses on the external business environment to describe the ecosystem and the relationships and dependencies within it. The main difference to other theories is the emphasis on the entrepreneur itself rather than the enterprise. Entrepreneurs are considered leading players in keeping the system alive and thriving (Stam 2015).

This fact leads to a different role for the government - compared to other policy concepts - as a “feeder” to the ecosystem, leaving the “leader” role to the private entrepreneur (Feld 2012).

Entrepreneurial Ecosystem attributes

According to Feld (2012) there are nine core attributes that are relevant to the success of an entrepreneurial ecosystem. These attributes focus on (social) interactions between different stakeholders in the ecosystem and their access to relevant resources, such as funding, workforce and services as well as an enabling role of the government (see table 1).

Table 1: 9 attributes of a successful start-up community

Attribute	Description
Leadership	Strong group of entrepreneurs who are visible, accessible and committed to the region being a great place to start and grow a company
Intermediaries	Many well-respected mentors and advisors giving back across all stages, sectors, demographics and geographies as well as a solid presence of effective, visible, well-integrated accelerators and incubators
Network density	Deep, well-connected community of start-ups and entrepreneurs along with engaged and visible investors, advisors, mentors and supporters. Optimally, these people and organizations cut across sectors, demographics and culture engagement. Everyone must be willing to give back to his community
Government	Strong government support for and understanding of start-ups to economic growth. Additionally, supportive policies should be in place covering economic development, tax and investment vehicles
Talent	Broad, deep talent pool for all levels of employees in all sectors and areas of expertise. Universities are an excellent resource for start-up talent and should be well connected to community
Support Services	Professional services (legal, accounting, real estate, insurance and consulting) are integrated, accessible, effective and appropriately priced
Engagement	Large number of events for entrepreneurs and community to connect, with highly visible and authentic participants (e.g. meet-ups, pitch days, start-up weekends, boot camps, hackathons and competitions)
Companies	Large companies that are the anchor of a city should create specific departments and programmes to encourage cooperation with high-growth start-ups
Capital	Strong, dense and supportive community of venture capitalists, angels, seed investors and other forms of financing should be available, visible and accessible across sectors, demographics and geography

Source: Stam 2015, Feld 2012 p 186-187.

There are other sources indicating distinct factors as relevant for an entrepreneurial ecosystem. The World Economic Forum (2013) lists 8 pillars for a thriving ecosystem which also require resources such as workforce, funding and services,

formal (government) and informal institutions (culture) as well as access to local and international markets (see table 2).

Table 2: Entrepreneurial ecosystem pillars and their components

Pillar	Components
Accessible markets	Domestic market: large/medium/small companies as customers and governments as customer Foreign market: large/medium/small companies as customers and governments as customer
Human capital/ workforce	Management talent, technical talent, entrepreneurial company experience, outsourcing availability and access to immigrant workforce
Funding & finance	Friends and family, angel investors, private equity, venture capital and access to debt
Support systems/ mentors	Mentors/advisors, professional services, incubators/accelerators and networks of entrepreneurial peers
Government & regulatory framework	Ease of starting a business, tax incentives, business-friendly legislation/policies, access to basic infrastructure, access to telecommunications/broadband and access to transport
Education & training	Available workforce with pre-university education, available workforce with university education and those with entrepreneurship-specific training
Major universities as catalysts	Promoting a culture of respect for entrepreneurship, playing a key role in idea-formation for new companies and playing a key role in providing graduates to new companies
Cultural support	Tolerance for risk and failure, preference for self-employment, success stories/role models, research culture, positive image of entrepreneurship and celebration of innovation

Source: Stam 2015, World Economic Forum 2013 pp. 6–7.

All these principles emphasise local parameters and focus on a (social) bottom-up process. This is in line with Isenberg’s (2010) Harvard Business Review article “How to start an entrepreneurial revolution”, where he stipulates 9 principles to achieve “venture creation”, and the “creation of an ecosystem”:

1. **“Stop Emulating Silicon Valley”**: While undoubtedly being the “gold standard” entrepreneurial ecosystem, it is deemed not to be a valid guide for any other region in the world. Unique circumstances led to the emergence of today’s Silicon Valley which can not be replicated in the eyes of Isenberg.

-
2. **“Shape the Ecosystem Around Local Conditions.”**: Isenberg strongly recommends that governments should tailor towards their unique local economic dimensions, resources and culture.
 3. **“Engage the Private Sector from the Start.”**: Only the private sector has the appropriate motivation to develop a profit-driven market in the eyes of Isenberg. Subsequently, structural barriers should be reduced in order to formulate entrepreneurship-friendly programs.
 4. **“Favor the High Potentials.”**: In order to be effective, Isenberg calls for programs focussing on ambitious, high-growth oriented entrepreneurs with large potential markets instead of spreading resources among quantities of ventures.
 5. **“Get a Big Win on the Board.”**: Isenbergs required thriving ventures to be highly visible in media and literature since visible success stories reduce entrance barriers and fear of risks for aspiring entrepreneurs.
 6. **“Tackle Cultural Change Head-On.”**: Since changing ingrained culture is deemed very difficult, altering social norms about entrepreneurship, failure and risk taking is considered as very important and should be on everyone's agenda in the eyes of Isenberg.
 7. **“Stress the Roots.”**: Isenberg recommends that governments should grant money carefully to ensure toughness and resourcefulness among the entrepreneurs and should not flood high potential entrepreneurs with easy money.
 8. **“Don't Overengineer Clusters; Help Them Grow Organically.”**: In Isenberg's opinion, there is little evidence that governments can successfully breed industry clusters. Governments should therefore build on existing clusters and nurture those that form independently from government action.
 9. **“Reform Legal, Bureaucratic, and Regulatory Frameworks.”**: Lastly Isenberg calls for administrative and legal barriers to new venture formation to be removed. Additionally bankruptcy should be decriminalised, shareholders should be shielded from creditors and it should be easy for entrepreneurs to start over in his view.

Unfortunately, scientific literature only provides long lists of relevant factors for thriving entrepreneurial ecosystems, without elaborating on their distinct effects on entrepreneurship and their independent influence on economic growth (Stam 2015), the key focus and reason behind the entrepreneurial ecosystem approach.

Entrepreneurial Ecosystem illustrations

Still there are many ways to illustrate the complex interrelations and dependencies within an entrepreneurial ecosystem. These illustrations provide an ample way to better understand the overall configuration of an ecosystem and highlight the many different stakeholders with their distinct perspectives.

Isenberg developed an illustration of entrepreneurial ecosystems (see fig. 3) during the Babson Entrepreneurship Ecosystem Project (BEEP), introducing six specific domains - culture, policy and leadership, finance, human capital, markets and supports (Isenberg 2011a, 2011b).

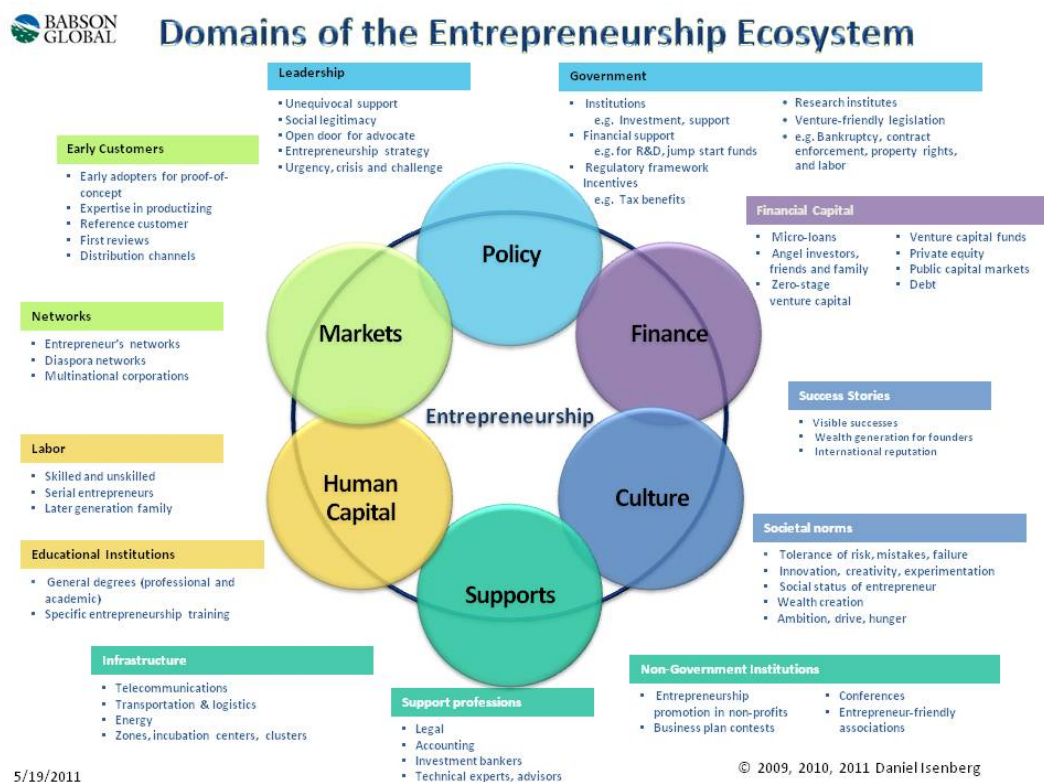


Figure 3: Domains of the Entrepreneurship Ecosystem

The policy domain calls for public leadership support, regulatory incentives and policy statements towards entrepreneurship. The finance domain requires the

availability of debt and equity financing as well as exit possibilities. The culture domain expects success stories to be visible and demands tolerance of risk and failure. The markets domain calls for entrepreneurial networks, sufficient early adopters and consumers as well as decent ways of distribution. The human capital domain not only requires experienced entrepreneurs but a supply of hireable talents as well as education and mentoring programs. Lastly, the supports domain aims at technological infrastructure, functioning legal and accounting systems and non-government institutions and activities (Isenberg 2010, 2011b).

The “Deutscher Startup Monitor” uses an illustration of the entrepreneurial ecosystem based on Isenberg’s findings in its 2014 edition (Ripsas & Tröger 2014). In addition to Isenberg’s external categories, the “Deutscher Startup Monitor” adds the categories of “enterprise perspective” and “employee perspective” (see fig. 4). The 2015 edition of the “Deutscher Startup Monitor” also uses this illustration throughout the entire document, highly emphasizing it as the framework for monitoring the German entrepreneurial ecosystem (Ripsas & Tröger 2015).

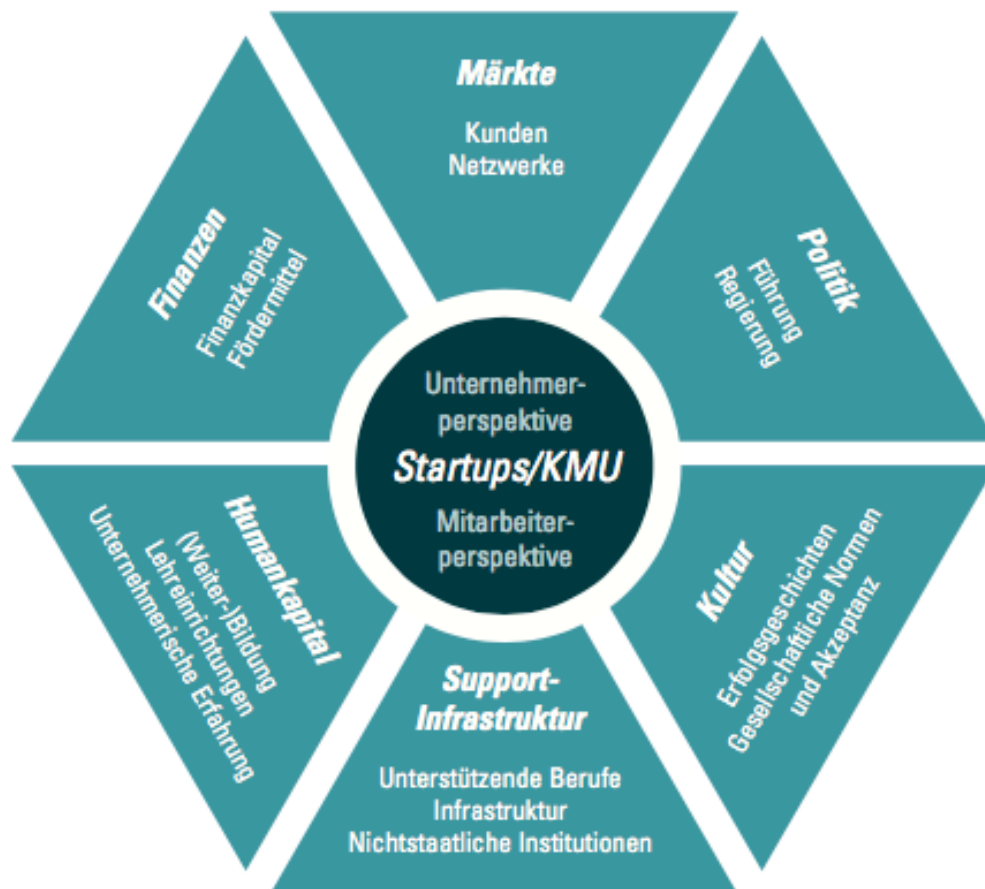


Figure 4: Entrepreneurship Ecosystem used in “Deutscher Startup Monitor” based on Isenberg (2011b)

Interestingly though, in the 2016 edition of the “Deutscher Startup Monitor” there is no mentioning of the framework anymore (Kollmann, et al. 2016). The document introduces a new academic framework, no longer solely focussing on the entrepreneurial ecosystem approach, but integrating elements of Kollmann’s “3K-Strategie (Köpfe, Kapital und Kooperation)” - heads, capital and cooperations - to foster innovative startups (Kollmann 2015).

Another more detailed approach is taken with the Ecosystem Canvas, developed by Dr. Thomas Funke, Head of the Entrepreneurship and Innovation department at the German Productivity and Innovation Centre (RKW), a think tank of the Federal Ministry for Economics. It describes an entrepreneurial ecosystem with 11 building blocks that illustrate its interrelationships and covers four main aspects of the ecosystem - ideas & talents, startup community, policy & finance and markets (see fig. 5). The canvas is meant to connect different stakeholders, show the “big picture” as well as interdependencies and to explore growth opportunities to accelerate the development of the ecosystem (Compass 2015).

The Ecosystem Canvas is utilised in Compass’ Global Startup Ecosystem Report 2015, analysing the top 20 global startup ecosystems.



Figure 5: The Entrepreneurial Ecosystem Canvas

An additional illustration is provided by Stam (2015), adding causal depth with four ontological layers and corresponding causations and relations to the description of entrepreneurial ecosystems (see fig. 6). In addition to illustrating the different stakeholders and their impact on the ecosystem, this rather recent approach tries to demonstrate how the ecosystem actually works, not just how it is set up.

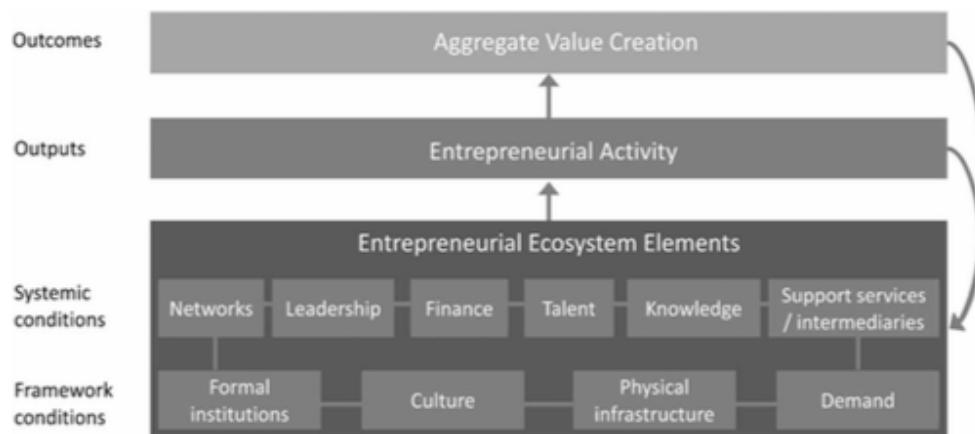


Figure 6: Key elements, outputs and outcomes of the entrepreneurial ecosystem

There are many other ways to illustrate the complexity of entrepreneurial ecosystems, most of them share many similarities as shown by the different approaches introduced so far.

Entrepreneurial Ecosystem metrics

It might in fact be more interesting to measure and track changes within entrepreneurial ecosystems over time, since it would allow to draw conclusions on what actions have actual impact on the ecosystem's development.

There are a few proposals on how to measure the vibrancy of entrepreneurial ecosystems. For instance the City of Sydney introduced specific metrics to track the development of the regional startup community and the regional entrepreneurial ecosystem in its Tech Startup Action Plan (City of Sydney 2016), a very extensive document, outlining the city's policy towards entrepreneurship. The "community indicator framework" intends to use various data inputs from both official data sources and community reports to account for economic diversity, economic growth, a vibrant support system and global recognition (see tables 3.1 and 3.2).

Table 3.1: City of Sydney - Community Indicator Framework

Primary indicator of dynamic, resilient local economies			
Indicator	Measure	Trend of target	Reporting frequency
Economic diversity	Number of new businesses	Increases	Five-yearly from 2007

Source: City of Sydney 2016

Table 3.2: City of Sydney - Community Indicator Framework

Other indicators of dynamic, resilient local economies			
Indicator	Measure	Trend of target	Reporting frequency
Economic growth	Number of startups	Increases	Yearly
	Number of co-working businesses and/or number of tech startups housed by co-working spaces	Increases	Yearly
	Amount of venture capital investment in startups	Increases	Yearly
	Amount of angel investment in startups	Increases	Yearly
	Number of tech startup IPOs or exits	Increases	Yearly
Vibrant support system	Number of networking and education events supported by the City of Sydney	Increases	Yearly
	Investment in networking and education events supported by the City of Sydney	Stable or increase	Yearly
	Number of participants attending networking and education events supported by the City of Sydney	Stable or increase	Yearly
	Feedback from participants attending events or programs supported by the City of Sydney	Positive	Yearly
	Number of startups accessing City of Sydney affordable rental space	Stable or increase	Yearly
Global recognition	Ranking on Innovation Cities Global Index	Increases	Yearly

Source: City of Sydney 2016

Another approach to measure the vibrancy of an entrepreneurial ecosystem is proposed by Stangler & Bell-Masterson (2015). By using 4 indicators - density, fluidity, connectivity and diversity - it provides a way to assess the overall performance of an entrepreneurial ecosystem, again utilising both official data sources as well as community reports (see table 4).

Table 4: Measuring Entrepreneurial Ecosystem Vibrancy

Indicator	Measure	Possible Sources
Density	New and young firms per 1,000 people	Census Bureau, Business Dynamics Statistics (BDS)
	Share of employment in new and young firms	Census Bureau, BDS
	Sector density, especially high tech	National Establishment Time Series (NETS)
Fluidity	Population flux	Internal Revenue Service
	Labor market reallocation	Quarterly Workforce Indicators (QWI)
	High-growth firms	Inc. 5000 and NETS
Connectivity	Program connectivity	Under development
	Spinoff rate	Possibly: CrunchBase; LinkedIn
	Dealmaker networks	Private databases, including Capital IQ
Diversity	Multiple economic specializations	Quarterly Census of Employment and Wages (QCEW)
	Mobility	Equality of Opportunity project
	Immigrants	American Community Survey (ACS)

Source: Stangler & Bell-Masterson 2015

Actionable metrics still remain to be produced, but these approaches seem promising in evaluating activities to foster entrepreneurship within regional entrepreneurial ecosystems.

Since the entrepreneurial ecosystem approach clearly draws on the interrelations between startup communities and external regional parameters, the “feeder” role of

the local government is important to recognise. Although it might seem that public policy and its implementation only has a supporting role to play, it could also be understood as a backbone for a thriving entrepreneurial ecosystem.

All in all it is evident, that regional policy towards entrepreneurship should not be about optimising specific indicators of entrepreneurial activity but about fertilising a ecosystem in which entrepreneurs and their enterprises can prosper (Stam 2015).

2.3 Public Policy Towards Entrepreneurship

Just like politics, entrepreneurship is local, since any type of enterprise must start somewhere (Ács & Armington 2006). Historically public policy surrounding economic development was focused on attracting existing firms from somewhere else to relocate or expand into the region. The concepts behind public policy towards entrepreneurship take a fundamentally different approach. According to the Knowledge Spillover Theory, entrepreneurship can generate economic growth by penetrating the knowledge filter. It focusses on commercialising recognised business opportunities that would otherwise remain unutilised through the formation of new firms (Ács & Szerb 2007).

Over the past decades globalisation led to the loss of jobs and stagnation in many regional economies. Therefore policy makers at state and municipal levels started to implement policies to strategically manage the regional economic development. Measures focussed on entrepreneurship in general as a driver of economic growth and subsequently resulted in new public policy agendas promoting entrepreneurship on all levels of government in the western world (Gilbert et al. 2004).

Economic growth and job creation

In 2000 the Global Entrepreneurship Monitor established an empirical link between entrepreneurial activity and economic growth at the country level (Reynolds et al. 2000). To show the effect more drastically, Kane (2010) gathers from U.S. employment data that startups create an average of 3 million new jobs per year, while all other firms combined loose 1 million jobs per year on average and claims them to be de-facto job destroyers. Furthermore he indicates that job growth is in fact solely driven by organically growing startup firms and implicates that effective public policy should include a more essential consideration for startup firms.

Many public policy initiatives around the world reflect these findings. For instance, the German Ministry of Economics and Technology (1999) introduced a variety of instruments to stimulate the founding of new enterprises, especially in high-technology industries. The EXIST program - aimed at startups spun-off from universities and research institutions - explicitly lists creating entrepreneurial culture, commercialisation of scientific knowledge and increasing the number of innovative startups as its goals (Bundesministerium für Bildung und Forschung 2000).

Entrepreneurship Policy effectiveness

Still, the merits around the connect between entrepreneurship and economic growth are highly disputed in scientific literature, as there is also evidence indicating it does in fact not always contribute to economic growth (Kösters 2010).

It is shown by many researchers, that high-growth entrepreneurship disproportionately effects innovative change and economic growth (Autio 2005b, Henrekson & Johansson 2008, Stam et al. 2009), while other forms of entrepreneurship do not. Most small firms do not grow (or do so only very slowly) while a few high-growth ventures are responsible for job creation (Ács & Mueller 2008). Although forms of entrepreneurship such as self-employment are preferable to unemployment, there is no evidence that it is economically preferable to regular employment (Autio 2005b).

To promote economic growth and job creation, public policy should therefore focus specifically on entrepreneurial firm growth. Since high-growth ventures are different from any other kind of new firm formation, they require unique forms of support. The main differentiators between regular entrepreneurship policy and high-growth entrepreneurship policy are quantity and quality. While regular entrepreneurship policy tries to increase the number of new firms and their stability, high-growth entrepreneurship policy focusses on quality and dynamism (Autio et al. 2007).

The most relevant differences between regular entrepreneurship policy and high-growth entrepreneurship policy are illustrated below (see table 5).

Although the importance of high-growth ventures for economic growth has been substantiated in empirical research and the intention to foster high-growth ventures is commonplace among policy makers, only very few public policy agendas target them explicitly or exclusively (Autio et al. 2007).

Table 5: Differences Between Regular and High-Growth Entrepreneurship Policies

	Regular Policy	High-Growth Policy
Policy Goals		
objectives in relation to entrepreneurs	Entice more people to become entrepreneurs	Entice the right people to become entrepreneurs
objectives in relation to entrepreneurial firms	Increase the number of new entrepreneurial firms	Increase the growth of entrepreneurial firms
objectives in relation to operational environment	Facilitate the environment for small business operation	Facilitate the environment for entrepreneurial firm growth
Resource Provision		
source	Mostly from public sources	Combination of public and private sources
type of financial resources	Grants, subsidies, soft loans	R&D loans and innovation grants, business angel finance, venture finance, IPOs
dominant service	Basic (standard) advice for firm creation, business planning, small business operation	Experience-based advice for venture finance; strategic planning; internationalization; organizational growth
resource distribution principle	Ensure equal access for everyone (resource spread)	Select promising recipients (resource focus)
Regulatory Emphasis		
life cycle focus	Remove bottlenecks to new business entry	Remove bottlenecks to entrepreneurial firm growth
compliance bottleneck addressed	Reduce cost of compliance for small businesses	Smooth compliance requirements for growing firms
fiscal regulations	Reduce VAT for small firms	Accommodate dramatic changes in firm scale; treat share options neutrally
attitude toward failure	Avoid failure, bankruptcy	Accept firm failure and bankruptcy, but reduce the economic and social cost of these
links to other policy domains	Industrial policy, social policy, labor policy	Industrial policy, innovation policy, labor policy
Source: Autio et al. 2007		

Providing public resources at some level to every entrepreneurial entity is not compatible with the goal of generating economic growth and job creation. Still, most policies remain general, unfocused and accentuate quantity. Economic impact requires more complex policy designs at different levels, well thought implementation and monitoring (Autio et al. 2007).

Entrepreneurship policy should cover various layers of society (see table 6) - from the individual entrepreneur to national economic and societal context - since it might not lead to positive outcomes if specific layers are ignored (Ács & Armington 2006).

Only if balanced measure are taken, considering both regional economic and social contexts, high-growth entrepreneurship can be stimulated. This calls for broad collaboration between multiple political stakeholders and policy shaping departments or ministries; and requires them to target their measures horizontally rather than vertically and expects active participation from industry, university as well as financial entities (Autio et al. 2007).

Table 6: Layers of Entrepreneurship Policy			
	Goals	Targets	Instruments
Agent – Occupational Choice Policies	More Effective Entrepreneurs	Individuals	- create awareness - entrepreneurship training - facilitate networks
Business – Enabling Policies	Continuous Innovation	New Firm Formation	- finance - regulatory relief - SBIR - science parks - tech commercialization
Economy – Supporting Policies	Economic Growth	Institutions – Universities Government Corporations	- R&D - higher education - venture capital
Society – Social Policies	Equal Opportunity	Wealthy Individuals	- philanthropy - taxes - social pressure - legal structure
Sources: Ács and Armington 2006, Autio et al. 2007			

Entrepreneurship Policy categories

Public policy measures for supporting high-growth oriented entrepreneurial ecosystems can be categorised as follows according to an examination of support initiatives in nine countries undertaken by Autio et al. (2007):

- BA and VC access
- Business coaching
- Business idea competition
- Commercialisation subsidies
- Consulting subsidies
- Entrepreneur training
- Entrepreneur spawning
- Incubation and technology parks
- Internationalisation financing
- Loan subsidies
- One-stop information shop
- R&D tax cuts
- Research commercialisation centers
- Research commercialisation grants
- Technological development subsidies (equipment & IP)
- Venture capital (tax) subsidies
- Venture capital funds

Furthermore, these measures can be clustered around pre startup formation and post startup formation as well as assigned to traditional policy domains such as innovation policy, business/industrial policy and financial market policy for a better understanding of the complexity (see fig. 7). In order for entrepreneurship policy to foster high-growth ventures, policy agendas have to cross typical policy silo limitations (Autio et al. 2007).

In terms of this thesis, any measures taken by regional or national government in regards to the startup economy can be considered as public policy towards entrepreneurship, regardless whether it is part of an official innovation policy program or an independent action.

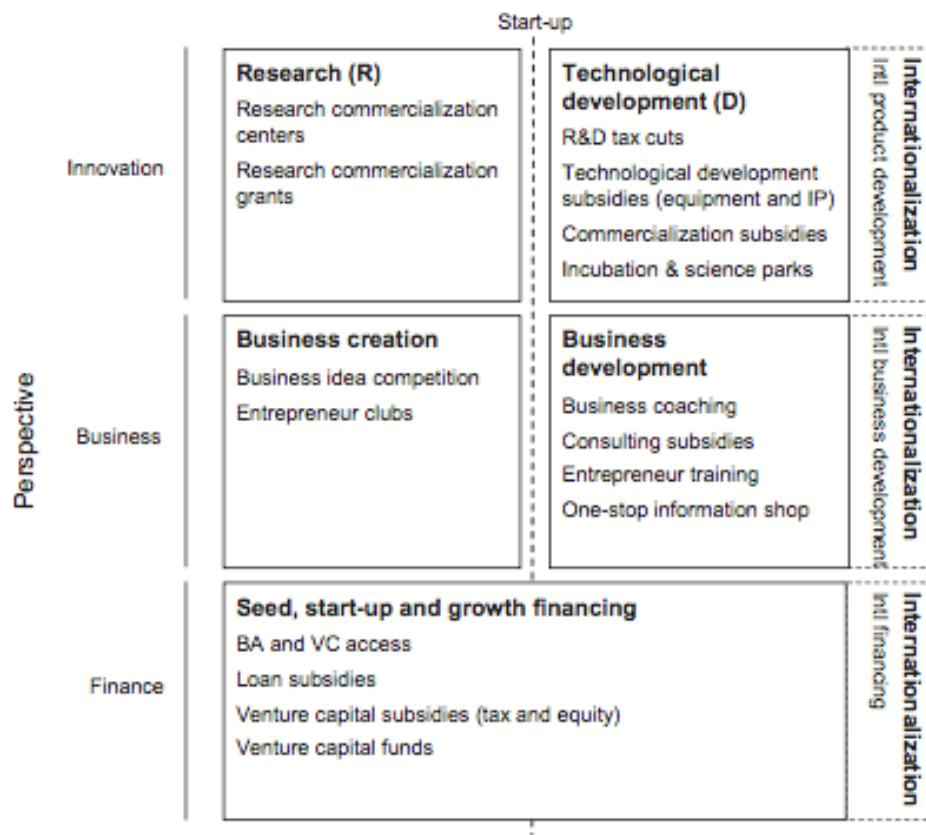


Figure 7: Thematic Categorization of High-Growth Entrepreneurship Support Measures

3 Introduction to Hamburg's Entrepreneurial Ecosystem

According to the KfW Startup Monitor 2015, Hamburg is the second largest startup location in Germany after Berlin. The city has a startup rate of 2.36% for the years 2012-2014 (as opposed to 2,6% in Berlin) and is further closing the gap in recent years. It has been the second largest startup location from 2008-2010 and from 2012 onwards (Metzger 2015). Even in 2003, more than 10 years ago, Hamburg had the highest Entrepreneurial-Activity-Quote (EAQ) in Germany (Losse 2004) and was one of the major centres for startups (Rooney 2012).

As city states, locations like Berlin, Hamburg and Bremen largely benefit from their metropolitan areas, accumulating startup activities within their vicinity. With highly attractive industry sectors such as media and IT as well as related creative industries, Hamburg has a disproportionately high rate of freelancers among new entrepreneurs (2014: 46%) compared to other locations in Germany (Metzger 2015).

Apart from freelance entrepreneurs, Hamburg also has a considerable history of high-growth ventures. Many Hamburg based startups have become well established, international corporations such as Innogames, Bigpoint, Coremedia, Facelift, Goodgame Studios, Jimdo, mytaxi, Parship, Statista or XING. Recently funded startups of note include Dreamlines, Kreditech, Protonet and Sonormed. Many international internet corporations subsequently chose Hamburg for their German headquarters over the years, such as AOL, Google, Facebook, Twitter, Hootsuite and Yelp (nextMedia.Hamburg 2016c). Just recently, hyped U.S. based startups such as Airbnb and Dropbox chose Hamburg for new office locations as well (Tracey 2016).

In accordance with the strong growth of the local startup economy over the past years, the City of Hamburg wants to position the metropolitan area as a leading region for innovation in Europe until 2020. Among other actions, the city plans to invest more than EUR 100 million into a “Smart-City” and the local startup economy (Tangermann 2016), although concrete implementation strategies for this plan remain to be announced as of November 2016.

Evidently, Hamburg has been a vibrant location for innovative startup activities over the past decades. Not only was Hamburg at the epicentre of the dot-com era in Germany, it provides an attractive entrepreneurial ecosystem to aspiring founders that has strong ties with the media industry.

3.1 Media Industry in Hamburg

According to the nextMedia.Hamburg initiative, Hamburg has more than 23.000 companies within the media/IT industry and therefore is one of the leading content locations in Europe. The vast majority of Germany's top 25 printed publications is produced in Hamburg. With 150 companies, the region is also positioning itself as a Gamecity, serving games to more than 760 million users worldwide. Additionally, around 34% of 96.000 companies within the service sector are offering information and communication services, such as advertising or marketing (nextMedia.Hamburg 2016b) and can be considered part of the media industry as well.

Hamburg's creative workforce generates more than EUR 10 billion in revenues every year with an added value of EUR 2.8 billion. The diverse portfolio of companies at all levels of the media and digital economy's value chain is considered to be of utmost importance for the economically relevant combination of content & technology and Hamburg's success as a "media city" (nextMedia.Hamburg 2016c).

	2009	2010	2011	2012	2013
Music industry	2,491	2,453	2,457	2,443	2,421
Book market	2,217	2,168	3,081	3,22	3,48
Art market	324	313	304	303	293
Film industry	3,277	3,292	3,288	3,252	3,237
Broadcasting industry	1,583	1,543	1,556	1,675	2,018
Performing arts	1,368	1,37	1,418	1,357	1,31
Design industry	6,514	6,453	6,765	6,85	6,943
Architecture market	2,785	2,914	3,06	3,267	3,524
Press market	10,9	10,506	10,145	10,215	9,824
Advertising Market	12,08	11,827	12,401	12,43	12,798
Software/games industry	10,203	10,679	11,136	13,091	14,285
Other	356	318	286	278	269

Source: Hamburg Chamber of Commerce (2015b)

According to Hamburg Chamber of Commerce (2015b), the City of Hamburg is seizing emerging business opportunities during the digital transformation and media convergence. It states effective networks between politics and industry as important facilitators in this regard, listing nextMedia.Hamburg, an initiative for the media/IT

industries in Hamburg created by the Senate of the Free and Hanseatic City of Hamburg, the Hamburg@Work e.V. association and the Hamburgische Gesellschaft für Wirtschaftsförderung (Hamburg Business Development Corporation), among many other initiatives, associations and public-private partnerships.

The top 5 cultural and creative industries in terms of employment are software/games, advertising, press, design and architecture in 2013 (Hamburg Chamber of Commerce 2015b). The most significant job growth occurred in the software/games industry which gained 4,082 jobs since 2009. Hamburg’s traditional advertising industry only grew slightly during this period and the press industry declined moderately with 1,076 jobs lost (see table 7).

According to Hamburg Chamber of Commerce (2105b) data, Hamburg is ranking fourth among Berlin, Cologne and Munich as “media cities” in terms of employees working in creative industries. In terms of revenue however, Hamburg only lost its leading position to Berlin in 2012, underlining Hamburg’s valid strategic alignment as a “media city” (see table 8 and fig. 8).

Table 8: Revenue trends in the cultural and creative industries in German media locations from 2006 to 2013 in EUR million

	2006	2008	2010	2012
Berlin	850	920	931	1,087
Cologne	740	840	791	847
Hamburg	1,030	1,090	1,037	1,065
Munich	850	910	922	1,018

Source: Hamburg Chamber of Commerce (2015b)

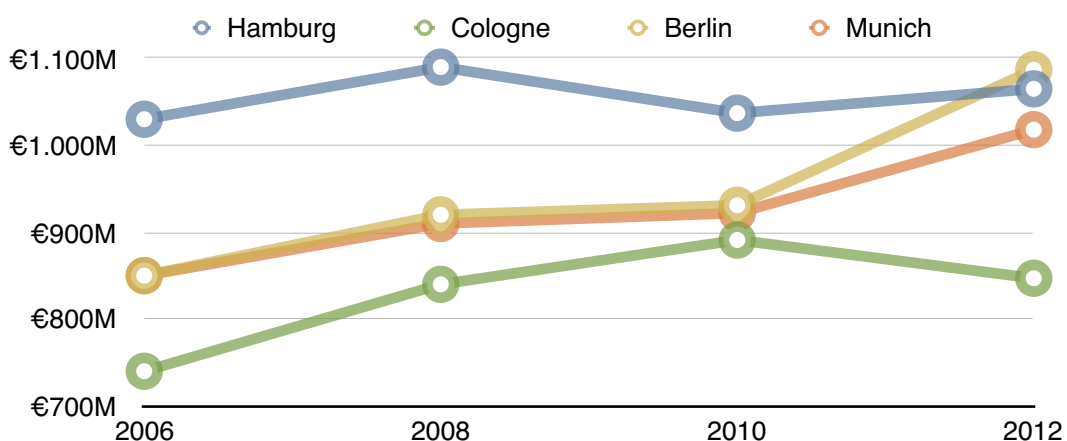


Figure 8: Revenue trends in the cultural and creative industries in German media locations from 2006 to 2013 in EUR million

The strength of Hamburg creative industries is also reflected in training opportunities and perspectives in higher education at local universities. Both public and private universities offer various fields of study that are related to the media industry. According to Hamburg Chamber of Commerce (2015b) the number of people training for creative careers at local universities is equal or even larger than in Berlin, the arguably largest city in Germany.

For a more detailed look into Hamburg's media industry, the largest 3 sectors - software/games, advertising and press - provide ample insights that separates Hamburg from other locations in Germany.

Software/games industry

Based on Hamburg Chamber of Commerce (2015b) data, Hamburg has grown significantly in the software/games sector over the past years. However, in terms of employment the region still remains far behind other "media cities" in Germany with around 14,000 employees in 2013 compared to Munich (28,455), Berlin (25,180) and Cologne (22,181). Despite the strong growth in employees of 40% since 2009, Hamburg remains outpaced by Berlin's growth of 80% in the same period.

Although Munich is dominant in the traditional software industry, Berlin and Hamburg are the centres for the games industry in Germany. Hamburg has gained the reputation as Germany's leading city for game development over the past years, which can largely be attributed to the "Gamecity:Hamburg" initiative founded in 2003, a public-private partnership facilitating the development of this industry sector in Hamburg (Hamburg Chamber of Commerce 2015b).

Based on number of employees, 4 of the top 10 game development companies in Germany are based in Hamburg (Games Wirtschaft 2016a). Evidently, Hamburg based browser game startups excelled over the past years, clearly outpacing other industry competitors. Goodgame Studios, Bigpoint and Innogames alone employ more personal (2,050) than the rest of the top 10 combined, of which Gamigo also has offices in Hamburg (see table 9). In addition some of the top 20 ranking game companies have offices in Hamburg as well (e.g. Kalypso Media).

Despite latest turmoils in the German game industry - during which Goodgame Studios radically reduced its staff by 500 people to 700 employees in Summer 2016 (Games Wirtschaft 2016c) - the sector itself remains strong with many open

positions at Bigpoint and other companies in Hamburg and Berlin (Games Wirtschaft 2016b).

Rank	Company	Location	Employees	Revenue in 2014 in EUR million
1	Goodgame Studios	Hamburg	1,200	202
2	Bigpoint	Hamburg	450	66.8
3	Gameforge	Karlsruhe	440	92
4	Innogames	Hamburg	400	80
5	Crytek	Frankfurt	355	>50
6	Gamigo	Hamburg/Berlin	300	15.1
7	Wooga	Berlin	300	>25
8	Blue Byte	Düsseldorf/Mainz	295	-
9	Travian Games	München	220	36.84
10	GameDuell	Berlin	160	>10
11	Daedalic	Hamburg/Düsseldorf	160	-
12	Flaregames	Karlsruhe	100	>5
13	Yager	Berlin	100	-
14	DS Fishlabs	Hamburg	90	-
15	Upjers	Bamberg	90	>5
16	Cipsoft	Regensburg	85	>5
17	Kalypso Media	Worms	80	-
18	Deck 13	Hamburg/Frankfurt	70	-
19	King	Berlin	70	-
20	Astragon	Mönchengladbach	65	>1

Sources: Games Wirtschaft (2016a), Statista 2016

Interestingly, it is difficult to gather detailed software/game industry revenue data for the City of Hamburg. Other than in the advertising or press sector, performance data is not shared as transparently. In 2008 the software/games industry generated combined revenues of EUR 1.16 billion in total (Hamburg Kreativ Gesellschaft 2012). Since the game sector in particular was responsible for the enormous growth in employees from 2009 to 2013, newer revenue data would be interesting to analyse.

Unfortunately, no recent data source with combined turnovers could be found.

Advertising industry

According to Hamburg Chamber of Commerce (2015b), Hamburg is the largest and most important location for the advertising industry in Germany. In terms of employment, the advertising sector is second only to the software/games industry within the creative industries in Hamburg. With around 13,000 employees in 2013, it clearly outpaces Munich (10,524), Berlin (9,217) and Cologne (8,259), the other three “media cities” in Germany. The reported revenues of EUR 2.6 billion in 2013 are the region’s second largest after the press industry (in creative industries).

The German Werben & Verkaufen magazine (2015) reports eight out of the top ten creative agencies in Germany as having offices in Hamburg in its creative ranking 2015, underlining the industries qualitative performance in Hamburg (see table 10).

The magazine transparently evaluates important creative awards such as Cannes Lions, Clio Awards, ADC Deutschland (ADC nails), New York Festival and calculates a creative score for the annual ranking of German advertising agencies.

Table 10: W&V ranking of creative advertising agencies 2015

Rank	Agency Group / Agency	Total Points	Rank previous year
1	Grabarz & Partner	2,096	17 (+16)
2	GGH Lowe	1,802	new
3	Kolle Rebbe	1,17	4 (+1)
4	BBDO	1,076	5 (+1)
5	Serviceplan	994	2 (-3)
6	Grey Germany	860	24 (+18)
7	Thjnk	854	9 (+2)
8	DDB	784	7 (-1)
9	Scholz & Friends	642	5 (-4)
10	Ogilvy Deutschland	530	8 (-2)

Source: Werben & Verkaufen (2015)

Among the 15 largest owner operated advertising agencies in Germany, 8 have their headquarter in Hamburg and an additional 2 have major offices within the city (see table 11), serving as an additional indicator for Hamburg as Germany’s number one location for the advertising industry.

#	Agency Group / Agency	Location	Revenue 2015 in EUR million	Change in % to previous year
1	Serviceplan	München	250.12	+4.89%
2	Jung von Matt	Hamburg	77.33	-4.78%
3	Media Consulta	Berlin	54.93	+4.75%
4	Vertikom	Nuremberg	52.67	+3.12%
5	Hirschen Group	Hamburg	45.22	+12.10%
6	Fischer-Appelt	Hamburg	32.00	+6.64%
7	Thjnk	Hamburg	36,00	+33.83%
8	Medienfabrik Gütersloh	Gütersloh	33.48	+2.34%
9	Kolle Rebbe	Hamburg	29.65	+16.77%
10	Grabarz & Partner	Hamburg	22.84	+27.57%
11	Philipp und Keuntje	Hamburg	21.00	+7.79%
12	Pahnke Markenmacherei	Hamburg	17.72	+17.88%
13	UGW	Wiesbaden	17.30	+1.74%
14	KNSK/Bissinger	Hamburg	16.48	+23.36%
15	Die Jäger	Röckersbühl	16.21	+0.19%

Source: Breyer (2016)

Press industry

Despite falling numbers of employees due to the digital transformation and increasing shift from print to digital media within the press sector, Hamburg remains the leading city for the press market in Germany, according to Hamburg Chamber of Commerce (2015b). With just under 10,000 employees in 2013, the sector beats all other “media city” locations in Germany - Berlin (9,158), Munich (8,909) and Cologne (5,548). With reported revenues of EUR 3.9 billion in 2013 it not only dominates the region as the strongest creative industry sector but outpaces Berlin (EUR 3.0 billion), Cologne (EUR 2.1 billion) and Munich (EUR 2.0 billion) with a turnover of EUR 396,000 per employee.

Historic publishers such as Axel Springer, Gerd Bucerius, John Jahr and Richard Gruner are at the heart of Hamburg’s prominent image as a “media city”. Despite recent shifts by large publishers such as Axel Springer SE towards Berlin (Manager Magazin 2003), many major press outlets are still based in Hamburg. Newspaper and magazine publishers such as DER SPIEGEL, DIE ZEIT, Gruner + Jahr, Bauer

Media Group, Funke Mediengruppe, Hubert Burda Media, Jahreszeiten Verlag, Mediengruppe Klamt and many others are at the core of Hamburg's press industry.

#	Corporation	Location	Revenue 2011 in EUR billion	Revenue 2015 in EUR billion	Change in %
1	Bertelsmann	Gütersloh	15.23	16.67	+9%
2	ARD	München	6.22	6.46	+4%
3	RTL Group	Luxemburg	5.77	6.03	+5%
4	Axel Springer	Berlin	3.19	3.04	-5%
5	ProSiebenSat.1 Media	Unterföhring	2.76	2.88	+4%
6	Hubert Burda Media	München	2.17	2.46	+13%
7	Bauer Media Group	Hamburg	2.00	2.26	+13%
8	ZDF	Mainz	1.99	2.11	+6%
9	Verlagsgruppe Georg von Holtzbrinck	Stuttgart	2.15	1.73	-20%
10	Gruner + Jahr	Hamburg	2.29	1.54	-33%
11	WAZ-Mediengruppe (today: Funke Mediengruppe)	Essen	1.10	0.93	-15%
12	Verlagsgruppe Weltbild	Augsburg	1.69	0.61	-64%

Sources: Hannen (2011), IfM (2015)

Among the 12 largest German media corporations (four of which are TV outlets (ARD, ZDF, RTL Group and ProSiebenSat.1 Media) and one is Bertelsmann, owning both RTL Group and Gruner + Jahr), 2 have their headquarter in Hamburg and all of them operate major offices in Hamburg (see table 12).

Since the technology-driven creative industry evidently is a major facilitator of Hamburg's economic development, many of the Hamburg based startups focus on business models close to the media and digital industry as is evident by taking a closer look at the venture capital investments and startup activities in Hamburg.

3.2 Venture Capital Investment Activity in Hamburg

With around EUR 300 million of venture capital investments in 2015, Hamburg is the 5th strongest VC location in Europe and 2nd in Germany (Ernst & Young 2016). Interestingly, the average deal size in Hamburg is EUR 10.57 million and about the

same as in Berlin with EUR 10.46 million, while Munich has a much smaller average deal size of EUR 3.89 million (see table 13).

Rank	Location	Investment in EUR million	Number of VC Deals	Average Deal Size in EUR million
1	Berlin	2,145	205	10.46
2	London	1,773	132	13.43
3	Stockholm	992	25	39.68
4	Paris	687	94	7.31
5	Hamburg	296	28	10.57
6	Munich	206	53	3.89
7	Zurich	135	24	5.63

Source: Ernst & Young (2016)

This could indicate that Hamburg is about as prospering in terms of VC funding as Berlin, just at another level of deal volume. In fact, the growth of Germany's entrepreneurial ecosystems outpaced other European regions in terms of VC investments for years and is driven particularly by Berlin, Hamburg and Munich (Ernst & Young 2015).

Among the top 5 startups in terms of funding in Germany, 2 are based in Hamburg. Gaming company Bigpoint, founded in 2002, received a total funding of USD 461 million and FinTech company Kreditech, founded in 2012, received total funding of USD 355 million as of September 2015 (see table 14).

Most of these investments are growth or later stage investments, usually done by investors from the UK, the U.S. and Asia. The largest investors according to Ernst & Young (2015) data are Kite Ventures, Phenomen Ventures, DN Capital, Insight Venture Partners, Blumberg Capital, Kreos Capital and Luxor Capital. Financing instruments used are both equity and venture debt. German later stage investments were done through venture capital firms such as Earlybird, Lakestar, Holtzbrinck Ventures and Rocket Internet among others. Prominent investment banks such as Goldman Sachs are also active in Germany. All of these international investment activities indicate the growing attractiveness of Germany's entrepreneurial ecosystems (Ernst & Young 2015).

**Table 14: Top 10 start-ups located in Germany
(based on total funding in September 2015 before Exit or IPO)**

#	Target name	Location	Target profile	Fouding year	Total funding value in USD million
1	Delivery Hero	Berlin	Food delivery service	2011	1,391
2	Bigpoint	Hamburg	Mobile games	2002	461
3	Kreditech	Hamburg	Big data credit scoring	2012	355
4	Foodpanda	Berlin	Food delivery service	2012	318
5	HelloFresh	Berlin	Food delivery service	2012	278
6	Zencap	Berlin	Digital credits marketplace	2014	253
7	BestSecret.com	Aschheim	Shopping community	2007	248
8	WetWing	Munich	Online furniture store	2011	179
9	Home24	Berlin	Online furniture store	2009	139
10	SoundCloud	Berlin	Music streaming	2007	123

Source: Ernst & Young (2015)

Looking at investments done in Hamburg specifically over the last years, the number of investors active regionally still is much smaller than in Berlin. Ernst & Young (2015) lists 36 key investors in Hamburg opposed to 110 in Berlin. This number might not be that indicative though, since it is unclear whether this data really indicates venture capital investment activity in Hamburg or is only linked to investors being stationed in Hamburg. The actual number of active investors might be very different and probably much higher since both national and international investors who invest in Hamburg based startups are not included in the list.

In any case, the data shows that Hamburg's entrepreneurial ecosystem is both thriving and attractive to both national and international investors, underlined by the biggest European VC funding in Q2 2016 - a USD 46 million series C round investment in Hamburg based startup Finanzcheck (KPMG & CB Insights 2016).

Among so called "unicorn" startups, companies with a valuation of over USD 1 billion, one is from Hamburg, four are from Berlin according to Ernst & Young (2015) data for 2015. Among four additional startups on their way to achieve this valuation, one company is from Hamburg while all others are from Berlin (see table 15). Rocket Internet could be excluded from this list since it actually is an incubator - investing in various startups and therefore not necessarily qualifying as a high-growth startup itself - making XING one of four "unicorn" startups in all of Germany.

#	Company name	Location	Valuation in EUR billion	Notes
1	Rocket Internet	Berlin	6.5	Successful IPO in October 2014
2	Zalando	Berlin	5.8	Successful IPO in October 2014
3	Delivery Hero	Berlin	3.1	Latest valuation (June 2015)
4	Hello Fresh	Berlin	2.6	Latest valuation (September 2015)
5	Xing	Hamburg	1.0	Market capitalisation September 2015
6	Home24	Berlin	942	Latest valuation (September 2015)
7	Kreditech	Hamburg	750	Latest valuation (July 2015)
8	Soundcloud	Berlin	700	Latest valuation (January 2014)
9	Foodpanda	Berlin	560	Latest valuation (September 2015)

Source: Ernst & Young (2015)

Clearly, Berlin is the number one entrepreneurial ecosystem in Germany, proven not only by media attention but startup rate (Metzger 2015), active investors, company valuations (Ernst & Young 2015) and investment volume (Ernst & Young 2016).

At the same time, Hamburg arguably is second with no other location in Germany catching up.

3.3 Startup Activities in Hamburg

The privately operated initiative Hamburg Startups developed the “Hamburg Startup Monitor”, closely reporting on startup activities within the Hamburg metropolitan area. Unfortunately only “live” data is available on the website, so no insights into recent changes or historic developments within the entrepreneurial ecosystem can be obtained. This is due to the fact that the “Hamburg Startup Monitor” has only gathered data for a short period of time, starting in 2015 (Jensen 2016). Still the data points gathered provide a convenient way to dive into Hamburg’s entrepreneurial ecosystem and its startups.

With more than 430 businesses on report in April 2016, the ecosystem is growing continuously with the most prominent startup categories being Commerce, Services and Media (nextMedia.Hamburg 2016b). In November 2016, more than 580 startups (see fig. 9) are on record on the website (Hamburg Startups 2016).

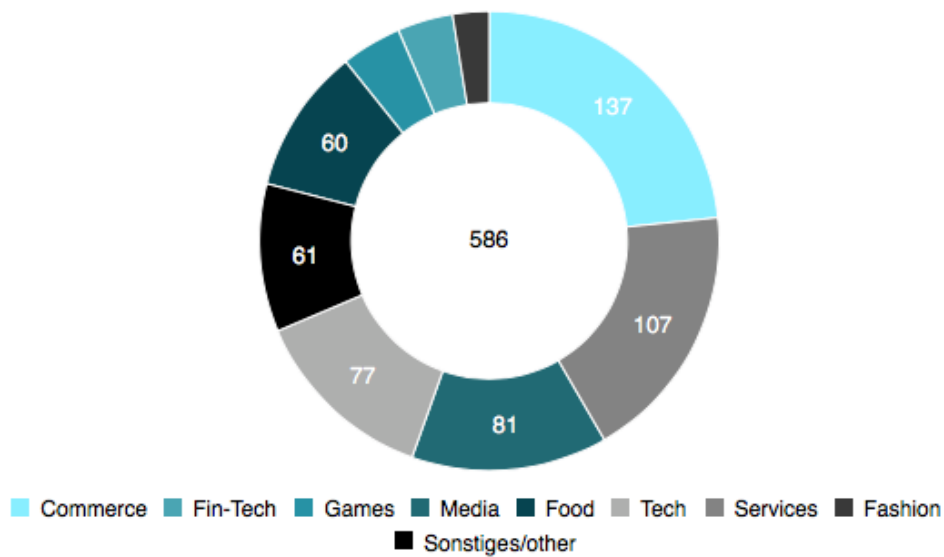


Figure 9: Category of startups monitored by Hamburg Startup Monitor

Lines between the startup categories might be blurry, since a fashion startup might also qualify as commerce startup and a FinTech startup might also qualify as a service startup. Especially with categories such as tech it might be very difficult to indicate a correct representation of the startup. In addition, since it is self reported data from startups, the categorisation might be incorrect or could change if the startup's perception of itself changes over time. Still the data provides some indication of what industries the startups within Hamburg's entrepreneurial ecosystem are related to.

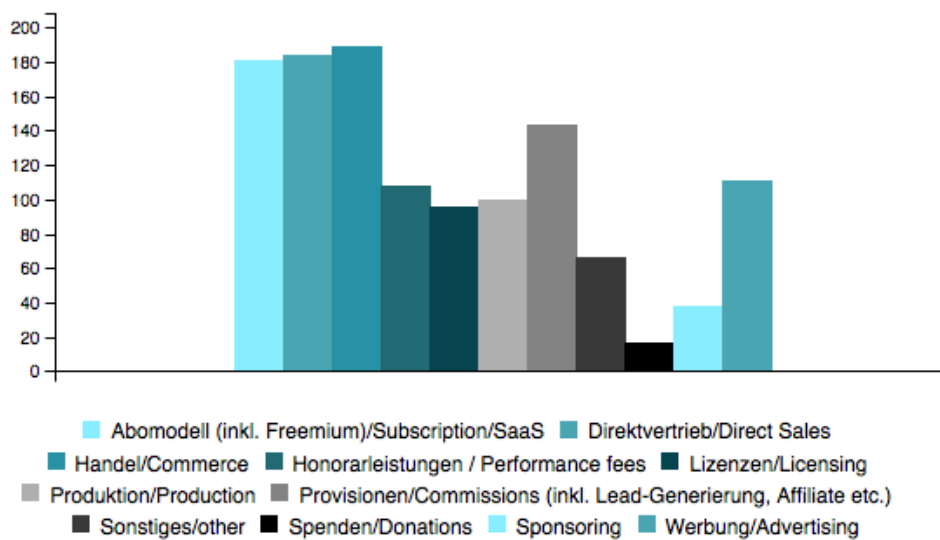


Figure 10: Business model pursued by startups monitored by Hamburg Startup Monitor

In terms of the individual business models pursued by Hamburg based startups the Hamburg Startup Monitor provides some insights as well. The most dominant business models for regional startups are subscriptions (freemium, subscription, SaaS), direct sales, commerce, commissions and advertising (see fig. 10). In regards to being closely related to media industry business models, the categories subscriptions, commissions and advertising seem highly attractive to established media industry value chains.

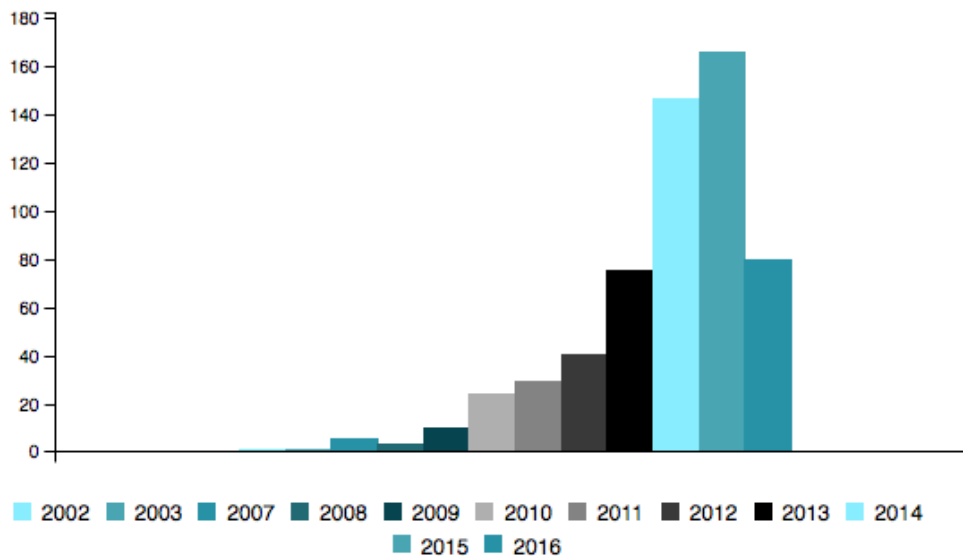


Figure 11: Founding year of startups monitored by Hamburg Startup Monitor

As illustrated before, startups may evolve very dynamically. They can rise and perish in the period of just very few months or even weeks. Therefore information about the age of local startups might provide a way to indicate both health of the entrepreneurial ecosystem in general and longevity of business ideas pursued by startups within in.

Based on the data available, 165 startups have been funded in 2015, 146 in 2014 and 75 in 2013 (see fig. 11), indicating either an increasing number of startups funded per year or a rather short lifespan of startups on report.

Ruffly half of all listed startups are in the “startup stage”, more than 150 are in the “later stage” and more than 100 are in the “seed stage” (see fig. 12). Interestingly more than 120 startups made no indication to their stage of development, indicating either a lack of expertise to categorise the startups stage or refusal to participate in efforts to create transparency within Hamburg’s entrepreneurial ecosystem.

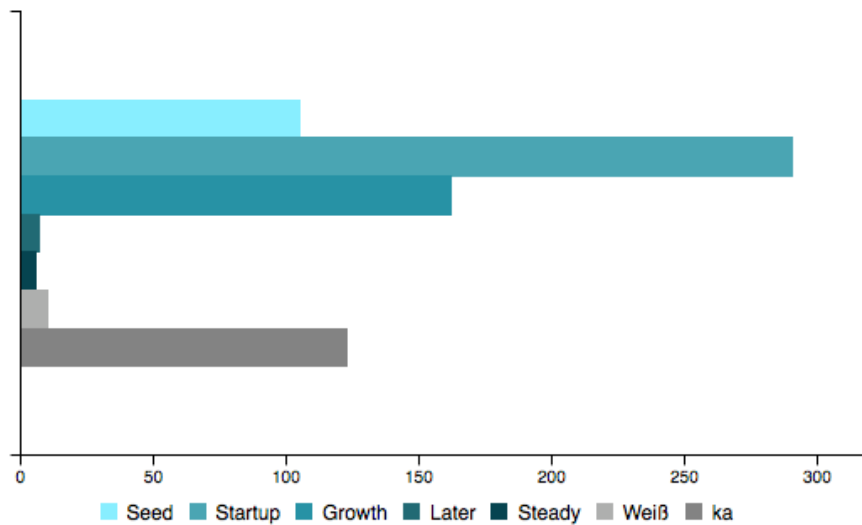


Figure 12: Startup stage of startups monitored by Hamburg Startup Monitor

Combined with the startups's age, interesting key performance indicators (KPIs) could be established over time. It might be interesting to monitor not only how many firms exist for how long, but how long it took them to reach certain stages of development.

Combined with data on business models and funding this could be extended to analysing how long it takes certain startups with specific business ideas under given funding conditions to reach a certain stage. Unfortunately despite historic data not being available yet, the necessary data on startup funding in Hamburg is not reported and might in fact be hard to obtain in a credible manner.

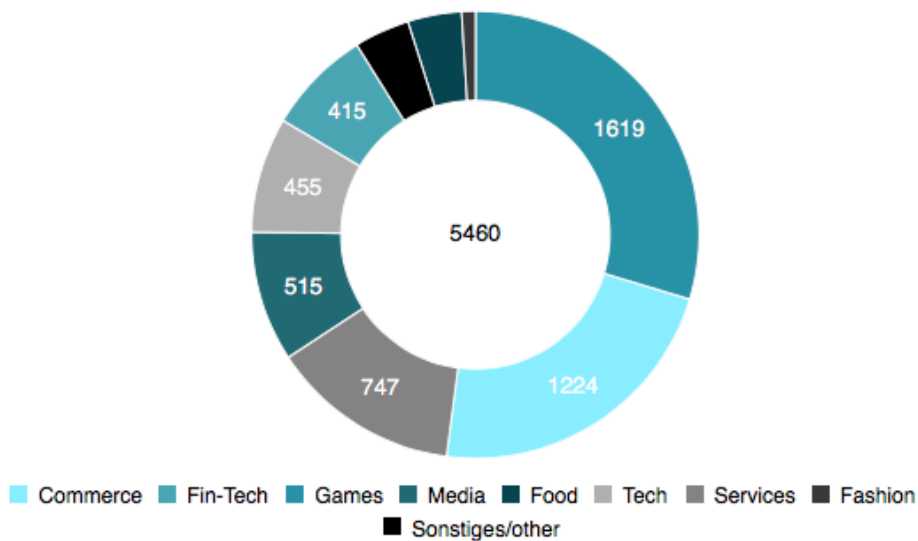


Figure 13: Number of employees by industry in startups monitored by Hamburg Startup Monitor

Other interesting data points collected by the Hamburg Startup Monitor show how many jobs are “created” by Hamburg based startups, 5460 as of November 2016 (see fig. 13). If historic data were available in the future, this might help to evaluate startups’ potential for job creation, one of the main arguments behind many innovation policy agendas promoting entrepreneurship around the globe.

To assess this data objectively it would be necessary to verify these numbers with official employment data provided by municipal government. In addition it might be prudent to evaluate employment statistics in related industries to survey whether certain jobs might be “destroyed” or “displaced” by innovative business ideas. Again this might be difficult to do since necessary data is unavailable but would be relevant to assess the impact of entrepreneurial activity on economic growth and job creation in Hamburg.

3.4 Stakeholders within Hamburg’s Entrepreneurial Ecosystem

As illustrated, Hamburg has a vibrant and very active startup community that evolved quite successfully over the past years. Ranking as the number 2 startup location in Germany, Hamburg has managed to position itself as a highly attractive entrepreneurial ecosystem with many different hotspots in terms of industry, business model and location within the city.

HoneyPot’s Startup Map of Hamburg

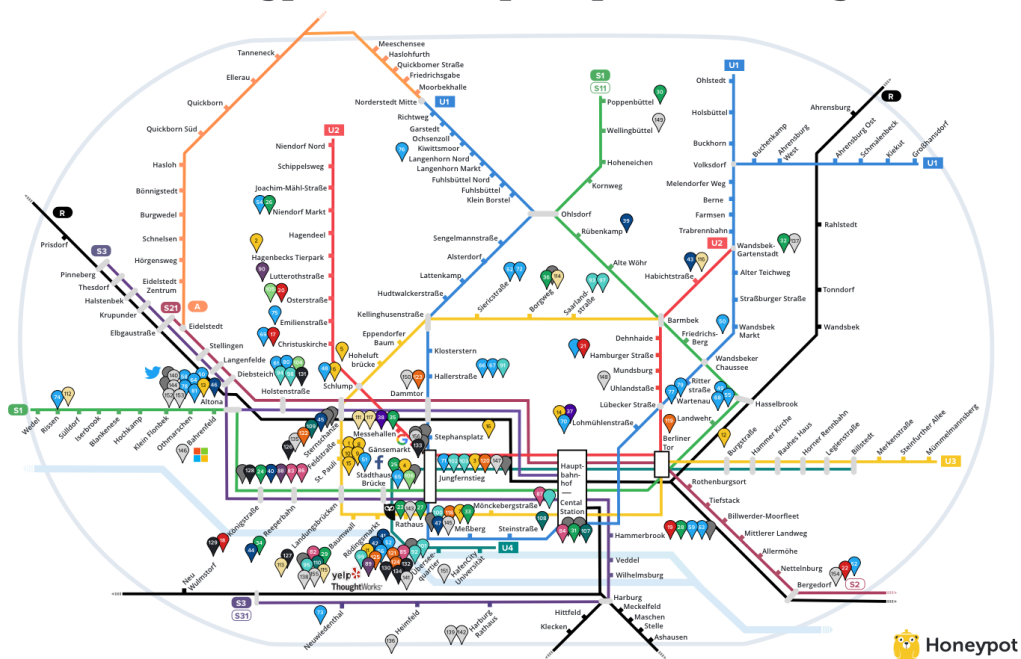


Figure 14: HoneyPot’s Startup Map of Hamburg

In May 2016, the developer-focused job platform HoneyPot created a Startup Map of Hamburg for their product launch in Hamburg (see fig. 14). It illustrates the geographic distribution of 157 startups on Hamburg's public transportation map, focussing on eCommerce, advertising technology and game industries (Tracey 2016).

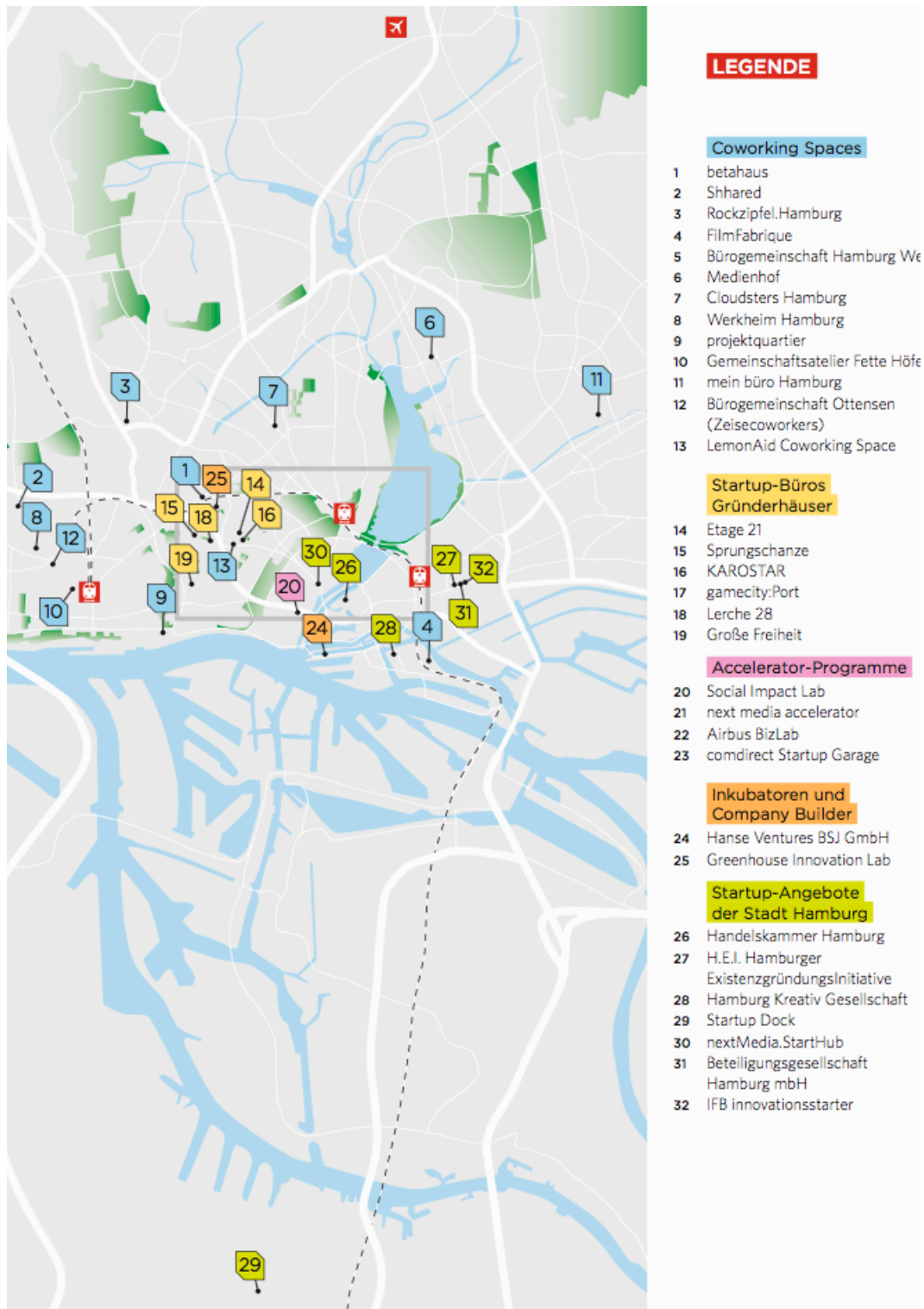


Figure 15: Important stakeholders in the entrepreneurial ecosystem in Hamburg

Still, the entrepreneurial ecosystem not only consists of the actual startups and their entrepreneurs. It also consists of interrelationships with universities, government, advocacy groups, financing entities and other industry players. All these entities are required to facilitate the potential for the startup's commercial success.

The nextMedia.Hamburg initiative plotted the most relevant stakeholders of the entrepreneurial ecosystem on a Hamburg city map. It clearly illustrates the geographical distribution of the entrepreneurial ecosystem members and shows a strong emphasis on the inner city of Hamburg (see fig. 15).

Specifically the quarters Hamburg Sternschanze and St. Pauli demonstrate heightened entrepreneurial activity. This might be due to the fact that these quarters are considered to be trendy and so called "Szene Viertel" (vibrant parts of town), according to the study "Kreative Milieus und offene Räume in Hamburg" commissioned by the City of Hamburg (Overmeyer et al. 2010) and might be chosen by startups for that reason among others.

As follows, important stakeholders of Hamburg's entrepreneurial ecosystem will be introduced and categorised by utilising the 6 domains - culture, policy and leadership, finance, human capital, markets and supports - introduced by Isenberg (2011a, 2011b) for reference. Many entities within the ecosystem are part of various different domains, illustrating both the complexity of entrepreneurial ecosystems as well as the need for horizontal networking and collaboration.

Co-working spaces

One of the most important entities within the entrepreneurial ecosystem are co-working spaces. It's where startups often have their office space at an early stage of development and where entrepreneurs, supporters and partners can meet.

In terms of Isenberg (2011a, 2011b) co-working spaces can be understood as entities in the supports domain since they promote entrepreneurship in general, help to organise business plan contests and conferences and provide office space for accelerators and incubators. Also, they are platforms for cultural change agents, making success stories visible, propagating innovation and creativity as well as tolerance of risk and failure. Therefore they belong to the culture domain. As part of the finance domain, they might provide access to angel investors, zero stage capital

as well as private equity by bringing entrepreneurs and potential investors together. Within the policy domain, they might be utilised as a conduit for entrepreneurship strategy outlined by the government and can provide access to investment and support institutions as well as legal and regulatory frameworks. Co-working spaces also provide access to local markets since it is where entrepreneurs can network with each other as well as with first customers for their products, therefore being linked to the markets domain as well. Lastly they function as a platform for the human capital domain as well since is where potential skilled and unskilled workforce can meet and be trained in specific entrepreneurial topics.

It might be adequate to conclude, that co-working spaces are core elements of any entrepreneurial ecosystem. It's where all stakeholders can meet, interact and collaborate and where all important issues within the entrepreneurial sphere have a prominent stage. In Isenberg's terms (2011a, 2011b), co-working spaces are relevant in all of the six domains to scale up an ecosystem for growth entrepreneurship (see fig. 4).

Many co-working spaces are operating within the Hamburg metropolitan area. A complete list of co-working spaces would be too long and also hard to obtain, therefore only the most prominent co-working spaces and startup offices are mentioned below.

betahaus: Operating as betahaus 2.0, the co-working space is home base of Hamburg's digital and creative community. Freelancers, startups, teams and firms are to be found within the 4 story building in Hamburg's trend district Sternschanze. The betahaus aims to be a place of learning, sharing, ideas, experiments, discussions and collaboration. Work desks can be rented at flexible rates, ranging from EUR 17 per day to EUR 250 per month for a fixed desk; conference rooms are provided and various workshops and events surrounding startup related topics are offered and organised either by betahaus or other members of the Hamburg startup community. Online: <http://hamburg.betahaus.de/>

Shhared: Located in Altona, Shhared offers flexible office, work and meeting spaces to entrepreneurs and startups. Propagating knowledge sharing and social interaction as driving forces behind productivity, the co-working space offers both short-term and long-term options, starting at EUR 10 for a half day ticket to EUR 370 for a fixed desk per month. Additionally conference and breakout areas are provided as well as events and workshops are offered. Online: <http://shhared.de/en>

FilmFabrique: Initiated by the Gängeviertel-Initiative and HamburgKino e.V., the FilmFabrique is a hotspot for Hamburg's film community, located in the Oberhafenquartier close to the Hafencity. Both commercial and non-profit film projects share office space at flexible rates, starting at EUR 16 per day. Monthly fixed desks cost EUR 266 and team offices are provided at EUR 798 per month. In addition a professional production studio is available for film and photo productions, castings, events, workshops etc. Online: <http://filmfabrique.de/>

Bürogemeinschaft Hamburg West: Located in Bahrenfeld, close to the highway, fixed desks are offered in a shared office environment at EUR 310 per month with access to conference rooms. Online: <http://bürogemeinschaft-hamburg-west.de/>

Medienhof: Targeting digital nomads, freelancers, creative professionals and small startups, the Medienhof co-working space located in Winterhude provides fixed desks at rates between EUR 250 and EUR 290 per month. In addition an artist and media office atelier on Mallorca is advertised as being connected with the Medienhof co-working space. Online: <http://medienhof-coworking.de/>

Werkheim Hamburg: With 2 locations in Ottensen this co-working space offers all inclusive offices for up to 12 people starting at EUR 450 per month, open space desks starting at EUR 11 for half day tickets and up to EUR 290 for a fixed desk per month. Additionally conference rooms and seminar locations can be booked for groups of up to 150 people and various services catering to demanding businesses are offered. Online: <http://werkheim-hamburg.de/>

projektquartier: Based at the Fischmarkt in St. Pauli in close proximity to the Reeperbahn, this co-working space offers fixed desks in an open office setting at EUR 380 per month with access to a conference room and lounge area. Online: <http://projektquartier.de/>

Gemeinschaftsatelier Fette Höfe: Focused on graphic, interior and motion designers as well as web designers, programmers and marketing creatives, the co-working space offers shared office spaces in Ottensen for EUR 290 per month for a fixed desk. Online: coworking-ottensen.de

mein büro Hamburg: This co-working space offers both single offices as well as shared office spaces in Barmbek-Süd, starting at EUR 229 per month for a fixed desk within the shared office environment. In addition access to seminar rooms can be provided. Online: meinbuero-hamburg.de

Bürogemeinschaft Ottensen (zeisecoworkers): zeisecoworkers advertises towards Online & IT professionals and offers co-working desks for EUR 200 per month as well as fixed desks for EUR 320 per month at the Zeisehallen in Ottensen, an old factory building. Some of the fixed desk offices are equipped with showers. Online: zeisecoworkers.wordpress.com

Rockzipfel Hamburg: With a focus on child care the co-working space in Eimsbüttel offers flexible office options for parents with small children, providing an alternative to traditional day care and kindergarten options. Online: <http://rockzipfel-hamburg.de/>

Social Impact Lab: The Social Impact Lab Hamburg, located in Hamburg's CBD close to the Altstadt, is financed by Barclaycard, Hans Weisser Stiftung (foundation) und HIT Stiftung (foundation) and is offering consulting and coaching service and subsidies for social entrepreneurs since 2013. There are additional labs in Berlin, Duisburg, Frankfurt, Leipzig and Potsdam. Apart from hosting events, conferences and seminars, office space is offered to interested peers in a co-working capacity. A fixed desk is offered starting at EUR 298 per month and meeting spaces can be rented as well. In addition the Social Impact Lab functions as an accelerator for social entrepreneurs, offering 3 distinct subsidy programs (see below). Online: hamburg.socialimpactlab.eu

In addition there are various co-working locations and commercial real estate properties owned or operated by the City of Hamburg which are specifically aimed at entrepreneurs.

Eifflerwerk: Advertised as an incubator for new ideas, the Eifflerwerk aims to be a hub for startups and young businesses within the creative industry and is located in Hamburg Sternschanze. The co-working space offers both team offices and shared office desks as well as larger workshop locations. Single desks can be rented starting at hourly rates. The project is subsidised with funds from the EU (EFRE) and was awarded the FIABCI Prix d'Excellence, an international and well esteemed real estate project award, in 2014. The location is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: www.eifflerwerk.de

Etage 21: Located at the “Alte Rinderschlachthalle” in St Pauli, Etage 21 claims to be one of the first projects for startups in Hamburg. Within the old meat-packing industry building 21 offices are offered in a shared office concept. The location is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: gewerberaum-hamburg.de/gruenderzentren/etage-21.html

Sprungschanze: Located in Hamburg Sternschanze, this project markets to young entrepreneurs within the media and music industry with affordable rent for a guaranteed period of up to 3 years. The project is part of the business park St. Pauli-Nord and was developed in collaboration with the private investor and owner Albrecht Peters in 2001. The location is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: sprungschanze.net

KAROSTAR: This project is catering to young businesses and aspiring entrepreneurs in the music industry with affordable rent. Located between Hamburg Sternschanze and St. Pauli in close proximity to many music industry companies, the office space provides access to recording and production studios. The project was subsidised by the EU (EFRE) and is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: karostar.de

gamecity:Port: This project is located in Hamburg Sternschanze and offers flexible conditions for entrepreneurs and fast growing new firms in the games industry with 13 offices of different sizes. The project was subsidised by local public funds and was created by private investor and owner Gunske Höfe GmbH. The project was initiated in collaboration with Hamburg@work and is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: gamecity-port.de

Lerche 28: This project focuses on female entrepreneurs and offers 16 small offices in Hamburg Sternschanze for a maximum period of 5 years. Short term rent starting at 4 weeks is offered as well. The project was developed by local government, the private association Unternehmer ohne Grenzen e.V. and steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg, which is also operating the property. Online: steg-hamburg.de/projektentwicklung/lerche-28.html

Große Freiheit: Aimed at entrepreneurs within the music or entertainment industry and located in St. Pauli, the project offers offices and sound prove rooms for aspiring sound and music designers. The project was developed with AIDA Cruses and is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: gruenderetagengrossefreiheit.de

Wellengang: Located in the former harbour hospital in St. Pauli, the project caters to marketing and media professionals. Financed with subsidies from EU (EFRE) and local funds in Hamburg, the project provides office space for entrepreneurs and young business (up to 2 years). The location is operated by steg Stadterneuerungs- und Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg. Online: gewerberaum-hamburg.de/gruenderzentren/wellengang-gruenderetage-gesundheitszentrum-st-pauli.html

Accelerators & Incubators

Also very relevant entities within the entrepreneurial ecosystem are accelerator and incubator programs, since they provide early stage investment vehicles for aspiring startups. These programs are usually professionally managed investment vehicles aiming at seed stage (accelerators) or startup stage (incubators) firms. In addition angel investors, often successful serial entrepreneurs or prosperous managers, and business angel networks are important early stage and high risk financiers for aspiring entrepreneurs.

In terms of Isenberg (2011a, 2011b), accelerators, incubators and angel investors belong to the finance domain. They provide high risk financing ranging from micro-loans and zero-stage capital to bigger seed investment deals. They can also provide early access to markets by introducing startups to early adopters, reference customers and providing them with distribution channels. In addition to the markets domain, these entities belong to the supports domain. They might provide legal and accounting support and have access to investment bankers for additional rounds of financing. In a limited capacity they are part of the culture domain as well since they help with success stories, wealth generation for founders and the international reputation of the entrepreneurial ecosystem.

There are various programs provided by Hamburg based corporations, the most prominent ones are listed below, some of which are also closely linked to Hamburg serial entrepreneurs and prominent angel investors.

Next Media Accelerator (NMA): Operated by dpa and launched in 2015, the program is probably the most prominent accelerator in Hamburg. With a strong focus on media value chain business models, it funds innovative startups with prominent media corporations such as Axel Springer, Gruner + Jahr, SPIEGEL GRUPPE and DIE ZEIT among others as investors. NMA offers a six month program (different from usually 3 months at many other accelerators), during which startups get intensive support at 3 tiers, bronze, silver and gold. Bronze requires the startup to give up 3% of equity for access to office space, networking, coaching, mentors and many other services offered by the Next Media Accelerator. Silver provides the startup with EUR 25,000 of funding for 5% of equity in addition to the services provided. Gold provides EUR 50,000 of funding for 10% of equity shares. Since the program is in high demand, there are application requirements to fulfil by any aspiring startup that wants to participate. So far there have been 3 batches of startups that participated in the program, 13 startups in total (as of November 2016). The NMA is located at betahaus Hamburg and also frequently organises Hackathons with industry heavyweights all over Germany. Notably, batch 1 startup Spectrm (chatbot technology) received funding from the prestigious Google Digital News Initiative in February 2016¹ and an additional USD 1.5 million investment by several investors in August 2016². Another batch 1 startup, AdTriba (cross-channel marketing management) received EUR 600,000 funding from the German High-Tech Gründerfonds (HTGF) in May 2016³. Online: nma.vc

Airbus Bizlab: The global accelerator program founded in 2015 by leading aerospace corporation Airbus is focused on business models close to the aerospace industry and funds startups working on industry related innovation in close collaboration with local and international airbus experts. The Hamburg based accelerator is the second Airbus Bizlab globally with other Airbus programs being

¹ Cuesta, S. G., 2016. Spectrm (Batch I) gets funded by Google DNI. *nma.vc*. Available at: <http://www.nma.vc/2016/02/our-batch-i-startup-spectrm-gets-funding-from-google-dni/> [Accessed November 10, 2016]

² Cuesta, S. G., 2016. Spectrm #batch 1 receives \$1.5 million investment. *nma.vc*. Available at: <http://www.nma.vc/2016/08/spectrm-batch-1-receives-1-5-million-investment/> [Accessed November 10, 2016]

³ Cuesta, S. G., 2016. AdTriba receives 600.000 Euro Seed-Investment. *nma.vc*. Available at: <http://www.nma.vc/2016/05/adtriba-600000euro-investment/> [Accessed November 10, 2016]

located in Toulouse and Bangalore (India). It is advertised as a “hybrid” program bringing startups and intrapreneurs (aspiring minds from within the corporation) together, offering a 6 month program of support and coaching. Airbus does not take equity from participating startups, but shares IP created during the extend of the program. Investment opportunities airing from the program are delegated to Airbus Group Ventures. Although Airbus has a major location in Hamburg Finkenwerder, the Airbus Bizlab is located at betahaus Hamburg and has funded 18 startups in 2 batches as of November 2016. Notably, startup 3DTRUST (digitisation service for additive manufacturing processes) raised a EUR 1 million series A round from several investors in November 2016⁴. 3DTRUST participated in the accelerator program in Toulouse. Online: airbus-bizlab.com

comdirect Start-up Garage: The comdirect bank (subsidiary of Commerzbank AG) initiated its innovation funding program in late 2015, claiming to be the first German bank to be actively funding early stage ventures in the FinTech sphere. The program funds innovative ideas within the financial industry and aims at Silicon Valley cliches with garage style offices in Quickborn. The program is not advertised as an accelerator per se, it rather aims at developing prototypes and minimum viable products (MVPs) with aspiring entrepreneurs while offering infrastructure, offices, soft- and hardware and monthly financial aid. The program started its first batch of 2 startups, CocktailTrade and Anyfolio, in January 2016, offering them a total funding of EUR 10,000 without taking any equity⁵. The comdirect Start-up Garage and its startups are located at betahaus Hamburg. Online: comdirect-garage.de

Greenhouse Innovation Lab: Operated by the international media corporation Gruner + Jahr, the program initiated in late 2015 funds internal ideas as well as external startups as an incubator and innovation laboratory. It advertises as not being a classic accelerator since it also incorporates internal business ideas and focuses on eCommerce, apps and social media tools. The lab provides access to Gruner + Jahr media reach, coaching, office space and financial aid during a 3 month program. No specific details on equity shares are provided. The only projects found as of November 2016 are Club of Cooks, a special interest network for

⁴ AirbusBizLab, 2016. 3DTRUST raises 1M€ !. *airbus-bizlab.com*. Available at: <https://airbus-bizlab.com/news/3dtrust-raises-1meu/view> [Accessed November 11, 2016]

⁵ Schlenk, C. T., 2015. Diese Fintechs ziehen in die Startup-Garage der Comdirect ein. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/fintechs-comdirect-startup-garage> [Accessed November 11, 2016]

YouTuber in the food segment, launched in late 2015⁶ and InCircles, a influencer marketing platform for food, living, parenting, travel, lifestyle, beauty and fashion segments, launched in late 2016⁷. The Greenhouse Innovation Lab is located in Hamburg Sternschanze. Online: greenhouse.media

Music WorX Accelerator: Initiated as subsidy program by Hamburg Ministry of Culture and the Hamburg Kreativ Gesellschaft in 2011, Music WorX offers innovative entrepreneurs with business ideas related to the music industry early stage funding since 2014. The Music WorX Accelerator offers networking, coaching, workshops, office space and financial aid to up to 3 teams per year in a condensed 3 month program. The funding is limited to EUT 5,000 for services and EUT 1,500 for living expenses and the accelerator does not take equity from the entrepreneurs. Recent startups are NOYS, FLITS and Audiodevel who joined the program in late 2016⁸. The Music WorX Accelerator is located at betahaus Hamburg. Online: musicworks-hamburg.de/accelerator

Liquid Labs: Liquid Labs is company builder within the Otto Group, one of Germany's leading mail-order and eCommerce corporations. Advertised as an independent platform for experimentation the firm aims to nurture the corporate innovation while taking advantage of startup methodologies and venture capital financing. The goal is to start and evaluate innovative business models and to create spin-offs for high-growth venture financing. The focus of Liquid Labs is FinTech and logistics. As of November 2016, the firm has started 7 businesses, 3 of which were closed and 4 were spun-off. The most recent spin-off was achieved by collectAI, a debt collection service launched in March 2016⁹. Liquid Labs is located in Hamburg's CBD, close to Jungfernstieg. Online: liquidlabs.de

⁶ Gruner + Jahr, 2015. Gruner + Jahr Digital gründet Special-Interest Netzwerk für Foodtuber: Club of Cooks. *guj.de*. Available at: <http://www.guj.de/presse/pressemitteilungen/gruner-jahr-digital-gruendet-special-interest-netzwerk-fuer-foodtuber-club-of-cooks/> [Accessed November 11, 2016]

⁷ Gruner + Jahr, 2016. Influencer Marketing aus einer Hand: Gruner + Jahr startet InCircles. *guj.de*. Available at: <http://www.guj.de/presse/pressemitteilungen/influencer-marketing-aus-einer-hand-gruner-jahr-startet-incircles/> [Accessed November 11, 2016]

⁸ Music WorX Hamburg, 2016. Die Music WorX Teilnehmer stehen fest. *music-worx.de*. Available at: <http://music-worx.de/news/die-music-worx-teilnehmer-stehen-fest> [Accessed November 11, 2016]

⁹ Brisslinger, L., 2016. Die nette Mahnung per Wahtsapp. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/collectai-mahnwesen-rechnungen-software> [Accessed November 11, 2016]

Hanse Ventures: The company was created by Jochen Maaß, founder of Artaxo, together with Bernd Kundrun, former CEO of Gruner + Jahr, and Rolf Schmidt-Holtz, former CEO of Sony BMG, in 2010. As a co-founding entity, the company-builder and incubator funds innovative business models with a focus on internet and mobile. With specialised support infrastructures and dedicated development, design and marketing teams as well as access to potential partners and additional investors. Hanse Ventures seeks to accelerate the growth of the startups under its wings. Aspiring entrepreneurs can apply with their business idea and might be accepted as co-founders. Additionally the company has an entrepreneur in residence program. The incubator has a proven track record with portfolio startups being funded by investors such as High-Tech Gründerfonds (HTGF), RI Digital Ventures and PDV Inter-Media Venture among many other private investors. Startups of note are geschenke.de Toptranslation and SEOlytics as well as REBELLE, a designer marketplace which secured a multi-million-Euro series B funding in 2015¹⁰ and pflege.de which secured several significant rounds of 7-figure financing as well¹¹. Hanse Ventures is located in Hamburg HafenCity. Online: hanseventures.com

TruVenturo: TruVenturo is a company builder, incubator and independent investor created by Nils Regge, founder of Casamundo, in 2008. Originally based in Hamburg, the company also has offices in Berlin, Sao Paulo (Brazil) and Varsity Lakes (Australia). The focus of TruVenturo's investments and entrepreneurial activities is international scalable internet business models in segments such as eCommerce, content, marketplaces, marketing and mobile. The company provides seed investment and growth financing in addition to support in building up the firm with dedicated development, marketing, human resources, finance and legal teams. Most notable investments are startups such as videobeat, hometogo, and dreamlines.de. Among supplementary investors in TruVenturo's startups are prominent entities such Acton Capital Partners, Altpoint Ventures, Target Ventures, DN Capital and Target Ventures¹². The most notable startup created by TruVenturo undoubtedly is finanzcheck.de which received several rounds of seven-figure funding over the past years and an enormous sum of EUR 33 million in the latest round (as

¹⁰ Scherkamp, H., 2015. Millionen für Rebelle. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/rebelle-finanzierung-serie-b> [Accessed November 11, 2016]

¹¹ Wirminghaus, N., 2015. Holtzbrinck Digital steigt bei Pflege.de ein. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/holtzbrinck-digital-pflege-de> [Accessed November 11, 2016]

¹² Hüsing, A., 2016. Hinschiede: TruVenturo sollten mehr Gründer kennen. *deutsche-startups.de*. Available at: <https://www.deutsche-startups.de/2016/04/21/truventuro-diese-hinschiede-sollten-mehr-gruender-kennen/> [Accessed November 12, 2016]

of November 2016) in early 2016¹³, the largest round of funding in all of Europe in Q2 2016 (KPMG & CB Insights 2016). TruVenturo's office in Hamburg is in the CBD close to the Altstadt. Online: truventuro.de

20Scoops: The company describes itself as an innovative international venture capital firm, providing investment and consulting for new digital business ideas. It is part of a family owned corporate group and has office locations in Hamburg and Chiang Mai (Thailand), arguable to provide access to the Southeast Asian market. The company was started in late 2016 and wants to develop a "startup campus" in Hamburg. So far there is no activity to report (as of November 2016). 20Scoops is located in Hamburg Barmbek. Online: 20scoops.com

Social Impact Lab: The Social Impact Lab Hamburg is financed by Barclaycard, Hans Weisser Stiftung (foundation) und HIT Stiftung (foundation) and is offering consulting and coaching service and subsidies for social entrepreneurs since 2013. There are additional labs in Berlin, Duisburg, Frankfurt, Leipzig and Potsdam. Apart from hosting events, conference and seminars, office space is offered to interested peers in a co-working capacity. As of November 2016, 3 distinct funding programs are offered at Social Impact Lab, Jungstarter, Impact Starter and Ankommer. Jungstarter offers consulting services for young professionals (<30) planning to get self-employed either from unemployment or pending unemployment. Impact Start is a scholarship program offering co-working, coaching, consulting and networking to aspiring social entrepreneurs. It expects a commitment of at least 20 hours per week and does not require an equity share. The Ankommer program advertises towards social entrepreneurs working on concepts to integrate refugees into society, specifically through education and industry training, and has a scope of up to 8 months and can include financial aid as well. Latest projects reported on the lab's website are Cocreate HH (a networking platform), Fair Furnisher (Furniture build by refugees from recycled materials) and Refugee Cantee (Education and training for refugees for the gastronomy industry). Most prominent startup is Heute in Hamburg, a successful event guide for Hamburg, that received large media attention after winning the Social Impact Lab pitch event¹⁴. The Social Impact Lab is located in Hamburg's CBD close to the Altstadt. Online: hamburg.socialimpactlab.eu

¹³ Scherkamp, H., 2016. 33 Millionen für Finanzcheck. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/33-millionen-finanzcheck> [Accessed November 12, 2016]

¹⁴ Schmiechen, F., 2015. Wie man sein Startup neu erfindet. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/sessionline-neustart-heute-in-hamburg> [Accessed November 12, 2016]

In addition to accelerators and incubators or means of financing through private angel investors, crowdfunding is getting more and more popular in Germany, very well due to highly visible success stories such as Hamburg based startup Protonet, which achieved the world record for the fastest crowdfunding with EUR 3 million raised within a matter of days during June 2014¹⁵.

Apart from traditional global platforms such as Kickstarter and indiegogo or German crowd-investing platform seedmatch, there is a local platform as well, although it might not be able to maintain the momentum of its international competitors, as is evident by Hamburg based startups choosing market leader portal Kickstarter over its regional pendant.

Nordstarter: The crowdfunding platform was initiated by Hamburg Kreativ Gesellschaft in 2011 and offers new financing perspectives for projects in Hamburg's creative industry. In the last 5 years (as of November 2016) projects ranging from movies, furniture, and music to magazines as well as apps and festivals have been funded. With more than 440 projects a sum of EUR 2.29 million in funding is reported¹⁶. Online: nordstarter.org

Venture Capital Investors

For more substantial investments there are several venture capital Investment firms active in Hamburg, usually aiming at growth stage or later stage financing. Other than the accelerators, incubators and usual angel investors, VCs provide much larger sums of investment and usually have higher expectation of growth and internationalisation.

In terms of Isenberg (2011a, 2011b), venture capital investors belong to the finance domains since they provide aspiring entrepreneurs with access to their funds as well as potential public capital markets in collaboration with investment banks. They also are important for the culture domain by being conduits for huge and highly visible success stories that boost the international reputation of the entrepreneurial ecosystem as well as social norms around innovation, ambition, wealth creation and

¹⁵ Strozyk, S., 2014. Strategieschwenk ins Wohnzimmer. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/protonet-maya> [Accessed November 12, 2016]

¹⁶ Startnext Crowdfunding, 2016: Crowdfunding für Hamburg Kreative. *startnext.com*. Available from: <https://www.startnext.com/pages/nordstarter> [Accessed November 12, 2016]

social status of entrepreneurs. Venture capital investment is a gateway to a high-growth ventures' success and in many cases VCs provide access to international distribution channels and infrastructure (often just in form of money). Therefore they also play an important role in both the markets and the supports domain.

Not all of the venture capital investors active in Hamburg are actually based in the city, but over the recent years the number of VC investments has increased significantly as outlined in chapter 3.2. Since it is not always evident where an investment is done legally despite the startups location, some of the most prominent venture capital investors active in Germany since 2012 (CB Insights 2015) are listed below.

High-Tech Gründerfonds (HTGF): Claiming to be Germany's most active and leading seed stage investor, the High-Tech Gründerfonds (HTGF) invests venture capital in technology-driven businesses. More information about this investor will be provided below. Online: high-tech-gruenderfonds.de

German Startup Group: German Startup Group is a Berlin based investor, claiming to be the most active private venture capital provider in Germany. It funds technology-driven companies located in Germany at any stage of development and collaborates with many company builders and accelerators, such as Hanse Ventures, HitFox, ProjectA Ventures and techstars. German Startup Group names prominent co-investors such as Andreessen Horowitz, DN Capital, Earlybid and Index Ventures. Among the funded companies are well known startups such as Amorelie, Delivery Hero, Mister Spex and reBuy.de. Soundcloud, one of Germany most valuable startups and aspiring "unicorn" (a startup with a valuation of over USD 1 billion), is also funded by German Startup Group (Ernst & Young 2015). Online: german-startups.com

IBB Beteiligungsgesellschaft: IBB Beteiligungsgesellschaft is a Berlin based investor, financing successful Berlin based startups focussing on creative industries, life sciences, industrial technologies and ICT. It was established in 1998 by the Investment Bank Berlin (IBB) and the City of Berlin. Since 2015 two distinct funds (EUR 60 million Tech Fund II, EUR 40 million Creative Fund II) are used to invest in qualifying startups. With more than 185 investment in more than 75 startups, the investor claims to have amounted a volume of EUR 252 million in venture capital funds. Among the funded companies are startups such as +Babbel, CareerFoundry, eDarling, nugg.ad and tape.tv. Online: ibb-bet.de

Bayern Kapital: Bayern Kapital is a subsidiary of the LfA Landesförderbank Bayern and invests in companies located in the German state of Bavaria only. Since 1995 around EUR 238 million have been invested in 250 innovative technology-driven companies. Among the companies funded by Bayern Kapital are startups such as commercetools, HolidayInsider and sunhill technologies. Online: bayernkapital.de

Holtzbrinck Ventures: Holtzbrinck Ventures was founded in 2000 as a subsidiary of the Holtzbrinck Publishing Group and claims to be one of the leading independent early stage funds in Europe focusing on internet businesses. With target investments between EUR 0.5 million and EUR 40 million at seed or early stage, the investors has funded more than 150 companies. The current fund size is EUR 285 million with EUR 635 million worth of assets under management. Most prominent startups funded by Holtzbrinck Ventures are Delivery Hero, Groupon, FlixBus, HelloFresh, Home24 and Zalando among many others. Online: holtzbrinck-ventures.com

Earlybird Venture Capital: Earlybird Venture Capital is a private entity based in Berlin, Munich and Istanbul, investing globally with initial sizes of investment ranging from EUR 250,000 to EUR 10 million. Since 1997 a total of 111 investment were done (as of November 2016) and a sum of EUR 750 million in capital was raised. Among companies funded by Earlybird Venture Capital are startups such as Auctionata, number26, Peak Games and Wunderlist. Online: earlybird.com

Target Partners: Target Partners is a private investor based in Munich with EUR 300 million under management and claims to be one of the leading venture capital investors in Europe. It finances young technology-driven companies in Germany, Austria and Switzerland during early stages of development, preferably being the first institutional investor. Among companies funded by Target Partners are startups such as adjust, mercateo and Scanbot. Online: targetpartners.de

T-Venture (now: Deutsche Telekom Strategic Investments (DTSI)): T-Venture was a venture capital investment entity of the Deutsche Telekom AG. During larger restructuring measures within the Telekom corporate group in 2014, T-Venture was closed and both assets and management team were integrated into Deutsche Telekom Capital Partners (DTCP) in the beginning of 2015¹⁷. In late 2015 all previous T-Venture assets were integrated into the newly founded Deutsche

¹⁷ Hofmann, A., 2014. Telekom startet neuen 500-Millionen-Fonds für Startups. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/dt-capital-partners-500-millionen> [Accessed November 23, 2016]

Telekom Strategic Investments (DTSI) based in Bonn, as were other investment vehicles such as the Telekom Innovation Pool (TIP)¹⁸. The investor claims not to continue with its previous investment focus despite generating good returns on investments. According to the investor's website, it manages a cumulative budget volume of over EUR 800 million and made over 200 investments with a current portfolio of around 70 companies. Among companies funded by T-Venture or now Deutsche Telekom Strategic Investments (DSTI) are startups such as 9flats, CoreMedia, flaregames, Jawbone, Mytaxi and 6 Wunderkinder. Online: telekom.com/en/company/at-a-glance/deutsche-telekom-strategic-investments

WESTtech Ventures: WESTtech Ventures is a seed venture capital investor based in Berlin. It focuses on technology-driven companies in markets such as software, software engineering, mobile services and media among others. WESTtech funds startups at very early stages of development, typically investing EUR 25,000 to EUR 250,000 in a first round. In addition it also operates an incubator called Flying Elephant. Among companies funded by WESTtech Venture are startups such as Book a Tiger, Delivery Hero, Edition F, Familonet and startup bootcamp. Online: westtechventures.de

Wellington Partners: Wellington Partners is a venture capital investor based in Zurich with two strong investment sectors, technology and life sciences. With total funds raised at EUR 700 million over the last 2 decades in its technology sector, it currently invests in food and agriculture technology as well as artificial intelligence and manages its previously funded entities. Among the portfolio companies are startups such as App Annie, Dropbox, Immobilienscout24, Qype and XING. In its life sciences sector, Wellington Partners focuses on markets such as medtech, digital health and industrial biotech. With EUR 200 million under management it invests at seed to late stages with total investments between EUR 1 million and EUR 10 million per company. Among the portfolio companies are startups such as Actelion, evolva, immatics and WaveLight. Online: wellington-partners.com

b-to-v: b-to-v is a venture capital firm and investor network with offices in St. Gallen and Berlin. In addition to investments it provides lead- and co-investment opportunities to its members. The investor focuses on highly scalable tech companies, typically investing between EUR 20,000 and EUR 10 million per company in total. b-to-v is actively investing in the DACH area (80%) and globally

¹⁸ Hofmann, A., 2015. T-Venture ist endgültig Geschichte. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/t-venture-dtsi-strategic-investments> [Accessed November 23, 2016]

(20%) according to the website. Among the companies funded are startups such as facebook, finanzcheck.de, immatics, sumup and XING. Online: b-to-v.com

Creathor Venture: Creathor Venture is a venture capital investor based in Bad Homburg, funding projects since 1984, claiming to have been the lead investor in 20 IPOs. The investments are focused on markets such as mobile, digital media, cloud technology, internet of things, sharing economy and FinTech among others and are often done with co-investors. Investment size can be up to EUR 3 million per round and about EUR 10 million per company. Among the funded companies are prominent startups such as Doodle, Native Instruments, netbiscuits and WaveLight. Online: creathor.com

Point Nine Capital: Point Nine Capital is a venture capital investor based in Berlin. Investments focus on early stage startups with SaaS and online marketplace business models. Investments are done globally with only about one third being done in Germany. Among the companies funded by Point Nine Capital are startup such as couchsurfing, DaWanda, Delivery Hero, Helping and Kreditech. Online: pointninecap.com

DN Capital: DN Capital is a venture capital investor with offices in Berlin, London and Menlo Park. It focuses on technology-driven companies at early and growth stages in markets such as eCommerce, software and mobile media among others. With 56 investments done at sizes between EUR 100,000 and EUR 20 million according to the website, the company has invested in startups such as Book a Tiger, Happn, Mister Spex, Shazam and windeln.de. Online: dncapital.com

iris capital: iris capital is a venture capital investor with a focus on technology-driven companies at different stages in markets such as social, new digital media, mobile services and cloud computing among others. Investments are mostly done in Europe while some are done North America, Asia and the Middle East. Typical investment sizes range between EUR 1 million and EUR 20 million per company. iris capital has office in Paris, Düsseldorf, Ryad, Dubai, Beijing, Tokyo, San Francisco and Montreal. Among the companies funded are startups such as adjust, DISQUS, rebuy.de and Searchmetrics. Online: iriscapital.com

All of these investors are located in Europe, all of them have offices in the DACH region with most of them focussing on Berlin as a base of operations. To get a more complete picture of venture capital activities in Germany it seems prudent to look at U.S. based investors as well.

According to research done by members of Idinvest's Venture Capital team, there are an additional 10 U.S. venture capital firms that are actually pursuing serious investments in Europe (Userovici 2016). In a process of analysing investment activity in Europe, it was concluded that only these 10 had more than 2 European startups they invested in during the recent two years (as of October 2016) and should be considered serious investors in the European entrepreneurial ecosystem.

Insight Venture Partners: Insight Venture Partners is a leading global venture capital investor founded in 1995 and based in New York City. 12 international office locations are mentioned in the website, six of them are in Europe, one in Germany. Insight Venture Partners claims to have raised USD 13 billion and to have done more than 250 investments in growth stage startups in software, internet and data-service markets. Among the companies funded by the investor are prominent startups such as alibaba.com, Flipboard, indiegogo, turnitin and Parallels. German startups of note are Delivery Hero (Berlin) and Hello Fresh (Berlin). Online: insightpartners.com

NEA - New Enterprise Associates: NEA is a venture capital investor founded in 1977. It is focused on technology and healthcare startups at any stage in any location. The investor has its headquarters in Chevy Chase, Maryland and additional offices in Menlo Park, San Francisco, Boston and New York as well as other locations in the U.S., Asia and India. NEA has raised USD 17 billion in capital and liquidated more than 500 companies with 208 IPOs and 350 mergers & acquisitions. Among the companies funded are prominent startups such as Box, Evernote, Groupon, Macromedia, TiVo and WebEx. European startups of note are Fantasyshopper (London), and Payleven (Berlin). Online: nea.com

Greycroft Partners: Greycroft Partners is a venture capital investor founded in 2006 with offices in New York City and Los Angeles. It invests in startups at any stage in markets such as eCommerce, cloud computing, FinTech and advertising technology among others. With USD 800 million under management the company has done 120 investments at every check size ranging from USD 100,00 to USD 20 million. Among the companies funded by Greycroft Partners are prominent startups such as App Annie, Buddy Media, The Huffington Post and Klout. German startups of note are 9flats (Hamburg), babble (Berlin) and Blinkist (Berlin). Online: greycroft.com

Valar: Valar is a venture capital investor located in New York City, investing in innovative technology startups globally and also explicitly outside of Silicon Valley. Among the companies founded by Valar are startups such as TransferWise and Xero. A German startup of note is Number26 (Berlin). Online: valar.com

Route 66 Ventures: Route 66 Ventures is a venture capital investor based in Alexandria, Virginia and focuses on the financial service industry. It provides early and growth stage capital for startups in the FinTech market with typical minimum investments of USD 1 million per company. Among the companies funded by Route 66 Ventures are startups such as AccessPay, judo, Next Capital and TrustedInsight. Startups of note from the DACH region are Knip (Zurich), Schutzklick (Berlin) and vaamo (Frankfurt). Online: route66ventures.com

USV - Union Square Ventures: USV is a venture capital investor based in New York City with USD 1 billion under management. Investments focus on companies that have the potential to radically transform important markets. Topics mentioned on the investor's website are creative A.I., digital healthcare, machine intelligence among others. USV can be considered as one of the most important venture capital investors worldwide, as partner Fred Wilson ranks top 2 of the Top 100 venture capitalists (CB Insights 2016). Among the companies funded by USV are prominent startups such as codecademy, Foursquare, Kickstarter, mongoDB and stackoverflow. German startups of note are auxmoney (Düsseldorf) and Soundcloud (Berlin). Online: usv.com

Lead Edge Capital: Lead Edge Capital is a venture capital investor based in New York City focussing on high impact growth, investing in markets such as eCommerce, internet and SaaS. Among the funded companies are prominent startups such as alibaba.com, Merkleto, Refinery29 and Uber. European startups of note are BlaBlaCar (Paris) and Delivery Hero (Berlin). Online: leadedgecapital.com

Sequoia Capital: Sequoia Capital is a venture capital investor founded in 1972 and based in Menlo Park with additional office in Asia, India and Israel. It has invested in companies that now have a combined stock market value of more than USD 1.4 trillion¹⁹ and can be considered as one of the most important venture capital investors worldwide, as partner James Goetz ranks top 5 of the Top 100 venture

¹⁹ Anders, G., 2014. Inside Sequoia Capital: Silicon Valley's Innovation Factory. *forbes.com*. Available at: <http://www.forbes.com/sites/georgeanders/2014/03/26/inside-sequoia-capital-silicon-valleys-innovation-factory/#caf153f5cb89> [Accessed November 22, 2016]

capitalists (CB Insights 2016). It focuses on energy, financial, healthcare, internet and mobile companies at different stages of development and typically invests between USD 100,00 and USD 1 million at seed stage, USD 1 million and USD 10 million at early stage and up to USD 100 million at growth stage per company²⁰. Among the the companies funded by Sequoia Capital are major corporations such as Apple, Atari, Cisco, Google and NVIDIA as well as prominent startups such as Airbnb, Dropbox, Evernote, Github and Instagram among many others. The list of funded companies seems like the who-is-who of Silicon Valley, indicating the ongoing significance of Sequoia Capital despite its age and new prominent and successful venture capital investment firms founded in recent years. A German startup of note is Wunderlist (Berlin). Online: sequoiacap.com

Benchmark: Benchmark is a venture capital investor founded in 1995 with offices in San Francisco and Woodside, California. It focuses on early stage startups in markets such as mobile, marketplaces, social and enterprise software. Benchmark's funds generated more than USD 22 billion in payout for its investors, creating a 1,000% gain for its backers over the past decade (as of early 2015). Benchmark can also be considered as one of the most important venture capital investors worldwide, as partner Peter Fenton ranks top 1 of the Top 100 venture capitalists (CB Insights 2016) although it only consists of 5 venture capitalists in total. Among the companies funded by Benchmark are prominent startups such as eBay, Snapchat, Tinder, Twitter, Uber and Zipcar and many others. A German startup of note is Contentful (Berlin)²¹. Online: benchmark.com

Bessemer Venture Partners: Bessemer Venture Partners is a venture capital investor founded in 2002, based in Menlo Park with additional offices in San Francisco, Boston, New York City, India and Israel. It invests in markets such as cloud, SaaS, infrastructure, mobile, commerce, healthcare and others from seed to growth stage with average investment sizes ranging from USD 100,000 to USD 75 million per company. With USD 4.5 billion under management and a track record of 117 IPOs, Bessemer Venture Partner funded prominent startup such as LinkedIn, Parallels, Pinterest and Skype. European startups of note are Intego (Paris) and Zopa (London). Online: bvp.com

²⁰ Rao, L., 2012. Sequoia Raises \$700M For Global Growth Fund. *techcrunch.com*. Available at: <https://techcrunch.com/2012/12/17/sequoia-raises-700m-for-global-growth-fund/> [Accessed November 22, 2016]

²¹ Konrad, A., 2015. The Benchmark Way: Five Partners Who Make Other VC Firms Look Outgunned And Overstaffed. *forbes.com*. Available at: <http://www.forbes.com/sites/alexkonrad/2015/03/25/benchmark-makes-other-firms-look-outmatched/#1c523a336528> [Accessed November 22, 2016]

As outlined, many of the U.S. largest venture capital investors are actively pursuing investments in Europe and Germany. 3 of the top 5 ranking venture capitalists (CB insights 2016) are investing in Europe's entrepreneurial ecosystem. Still, in regards to Germany these investment largely focus on Berlin. Only Greycroft Partners has a major stake in Hamburg based startup 9flats, a competitor of U.S. hit startup Airbnb.

Still there are many investors supporting Hamburg's entrepreneurial ecosystem. Hamburg Chamber of Commerce lists 26 investment companies (see table 16) and is referenced in the nextMedia.Hamburg initiative's investment Starter Kit for contacts to potential financing entities for startups and other interested parties within the city (nextMedia.Hamburg 2016a).

Company	Investment phase	Investment volume in EUR	Industries
Arcadia Beteiligungen Bense Tiefenbacher Co. GmbH	Buy-Out	> 1M	all
Adiuva Capital GmbH	Later Stage, going private	5M - 40M	all
BC Partners	-	-	-
Beaufort Capital GmbH	Growth Stage, Buy-Out	2M - 12M	ICT, medical, technology
BioAgency AG	Seed Stage, Early Stage, Growth Stage	-	health, life science
MPE Unternehmensbeteiligungen GmbH	Succession, Spin-offs	-	-
BTG Beteiligungsgesellschaft Hamburg mbG	Early Stage, Growth Stage	50,000 - 500,000	all
Caldec Holding GmbH	Growth Stage, Succession	-	-
CAPCELLENCE Mittelstandspartner GmbH	Growth Stage	-	electronic, manufacturing, industry, services
Capital Stage AG	-	-	renewable energy
CEE Management GmbH	-	5M - 35M	renewable energy
DMB Deutsche Mittelstand Beteiligungen GmbH	Later Stage	5M - 50M	all
ELBE PARTNERS Industries GmbH	-	-	industry, measurement, control engineering
Endeit Capital BV	all	1.5M - 15M	-
eVenture Capital Partners GmbH	Seed Stage, Growth Stage	-	IT, media, software
FCI FoundersClub GmbH	-	-	-
GLG Green Lifestyle GmbH	Growth Stage	-	digital media with social or societal impact

Table 16: Investment companies listed by Hamburg Chamber of Commerce

Company	Investment phase	Investment volume in EUR	Industries
Haspa Beteiligungsgesellschaft für den Mittelstand mbH	Later Stage	2M - 10M	all
H.I.G. European Capital Partners GmbH	Growth Stage, Buy-Out	-	all
HGU Hamburg Unternehmensbeteiligungs Aktiengesellschaft	Early Stage, Later Stage	-	all
IFB Innovationsstarter GmbH	Seed-Stage, Startup-Stage	100,000 - 1M	all
MPC Münchener Petersen Capital AG	-	-	infrastructure, maritime, real estate
Neuhaus Partners GmbH	Seed-Stage, Early Stage, Growth Stage	500,000 - 2M	T.I.M.E.S. (telecommunication, IT, media, entertainment, security)
New Commercial Room Beteiligungsgesellschaft mbH	Early Stage	-	IT, liege science, media
PRICAP Venture Partners AG	Early Stage, Growth Stage	-	IT, high tech, new media, telecommunication
Shortcut Ventures GmbH	Early Stage, Growth Stage	-	-

Source: Hamburg Chamber of Commerce (2016a)

Unfortunately, this list is scarce at best, with many of the listed companies not specifying the investment phase, investment volume or industries of focus. In addition this list is not specific to high-growth venture financing or the startup economy as is evident by the investment phase of many entities, such as Buy-out (Arcadia Beteiligungen Bense Tiefenbacher Co. GmbH. or H.I.G. European Capital Partners GmbH) or Succession (eg. MPE Unternehmensbeteiligungen GmbH or Caldec Holding GmbH). Only very few entities listed specifically target the seed stage (e.g. eVenture Capital Partners GmbH or Neuhaus Partners GmbH) and just one targets the startup stage (IFB Innovationsstarter GmbH). Nevertheless it might be a good starting point to evaluate investment potential of local capital firms for the entrepreneurial ecosystem in Hamburg.

In its list of active key investors in German startups, Ernst & Young (2015) mentions 36 Hamburg based entities specifically. These are German companies who are actively investing in newly founded businesses with high-growth expectations within the entrepreneurial ecosystem of Hamburg. Unfortunately, it remains unclear what qualifies these investors as key investors in regards to venture capital investments in high-growth startups (see table 17).

Table 17: Key investors in the Hamburg startup scene

Investor	Fund size	Shareholder	Investment Focus	Portfolio (excerpt)
Aura Capital Management GmbH	n.a.	Entrepreneurs, Family Offices, Management Team	European SMEs	Edel-Optics
Bauer Venture Partners	EUR 100 M	Bauer Media Group	Digital Media Publishing Technology	Lifesum, Yummly, CareerFoundry, navabi, Contorion
Beaufort Capital GmbH	EUR 2-12M	n.a.	European SMEs, ICT, Medical, Technology	Nordseewerke Emden Shipyard, proAlpha, snom technology, CIDEON, getemed, Dr. Födisch Umweltmesstechnik
CatCap GmbH	consulting only	Management Team	Commerce, FinTech, Life Science, Medial, Technology	more than 250 M&A projects
Centuere Beteiligungs-AG	n.a.	n.a.	Marketing, Media	n.a.
Cinco Capital GmbH	n.a.	Lars Hinrichs (XING founder)	Commerce, Digital Media, FinTech, ICT, Marketing, Technology,	Mytaxi, Scanbot, Social Gaming Network, Fab, Brille24, Flip4New, seedcamp,
Cleanventure AG	n.a.	Philipp Moffat (Tyros AG)	Renewable Energy	Thermondo
Deutsche Druck- und Verlagsgesellschaft mbH	n.a.	Social Democratic Party Germany (SPD)	Digital Media, Publishing, Printing Press, Radio	GLG Green Lifestyle, Next Media Accelerator, Stuffle, TIVOLA Publishing, Verlagsgesellschaft Madsack, Neue Presse, Neue Westfälische
Digital-Pioneers N.V.	n.a.	Heiko Hubert (Bigpoint founder)	Digital Media, Technology	Easybill, Kreditech, meetOne, HitFox, AppMe, Stuffle
dpa-infocom GmbH	n.a.	dpa	Digital Media, Publishing Technology	Next Media Accelerator,
eVentures Capital Partners	USD 340M	Otto group, Management Team	AdTech, Commerce, FinTech, Media	Groupon, App Annie, Sonos, YuMe. 9flats, Amplify, betaworks, del.icio.us, kaufda, Wine in Black, TVSmiles,
Equity Seven Beteiligungsgesellschaft mbH	n.a.	Kai Teute (serial entrepreneur)	Digital Signage, QSR, Technology	Domono's izza, Gastrofox, Lieferheld, DailyDeal, Coupies, Kaiserwetter
Fat Lucust Invest GmbH	n.a.	Jan Andresen	n.a.	CouchCommerce
Fielmann Ventures GmbH	operates as incubator	Fielmann AG	Eyewear industry	n.a.
FRW Bach Invest GmbH & Co. KG	operates "talocasa" startup	Sebastian Wagner, Miguel Ruth, Matthias Frenzel	Commerce, Digital Media, Marketing	talocasa
GLG Green Lifestyle GmbH	n.a.	Deutsche Druck- und Verlagsgesellschaft mbH	Sustainable Business Models	avocadostore.de, utopia.de, Öko-Test,

Table 17: Key investors in the Hamburg startup scene

Investor	Fund size	Shareholder	Investment Focus	Portfolio (excerpt)
Gruner + Jahr GmbH & Co KG	n.a.	Bertelsmann AG	Digital Media, Publishing Technology	Ligatus, adyard, notworkplay.in, xx-well.com, BabyGear, Tuasendkind
H2-Investments GmbH	n.a.	Heiko Hubert (Bigpoint founder)	Early Stage Venture Capital Investments	Toptranslation, Cashboard, Kreditech
HackFWD Capital GmbH & Co KG	no longer active	Lars Hinrichs (XING founder), Jakub Tlalka	Seed Stage Funding for Technology Ventures	YieldKit, Cobook, Infogram, Filmaster, Sharypic, Pro 3 Games, yoone
Hanse Ventures BSJ GmbH	n.a.	Jochen Maaß (Artaxo founder), Start 2 Ventures GmbH, Management Team	Commerce, Digital Media, Mobile	artaxo, Toptranslation, pflege.de, Rebelle, geschenke.de
IFB Innovationsstarter GmbH	EUR 12M	Hamburgische Innovations- und Förderbank (IFB HH)	Seed Investment for Innovative Startups	Sonormed, Familo, RetroBrain, Cumstomcells, p3dsystems
Innovationsstarter Hamburg	n.a.	IFB Innovationsstarter GmbH	Seed Investment for Innovative Startups	Embella, Yoints, Asset Profilers
iVentureCapital GmbH	n.a.	Michael Reul, Management Team	Affiliate Systems, Games, Technology	Appanatics, trafficcaptain.com, Farbflut Entertainment, Infernum Productions, billingpartner.com
J.C.M.B. Beteiligung GmbH	n.a.	Jürgen Uhlemann, Marcel Uhlemann	Commerce, Education, Health, Services	Youmix, The European, Sofatutor, Clipdealer
Jahr Assetmanagement GmbH	n.a.	n.a.	n.a.	Nu3
Neuhaus Partners GmbH	EUR 126M	Gottfried Neuhaus, Management Team	T.I.M.E.S. (Telecommunication, IT, Media, Entertainment, Security)	1000jobboersen, Apprript, Smava, Toling, Searchmetrics, Content Fleet, Smava
Pacama GmbH	n.a.	n.a.	n.a.	SPM Sportplatz Media
Parklane Capital Beteiligungsberatung GmbH	consulting only	Björn Söder (getgo founder), Management Team	Internet, Media, Technology	MeetOne
Raffay & Cie. GmbH	n.a.	Management Team	Early Stage Venture Capital and Real Estate	9flats, Debitos, Westwing, Putfittery, Flaconi, Monoqi, momox, danato, pflege.de, yogaeasy.de, windeln.de, Urbanara, meinauto.de
SCG Beteiligungs UG	n.a.	n.a.	n.a.	Rebelle
Schmidt von Ahlen Capital GmbH	n.a.	Martin Schmidt (Jobleads and Yoom founder), Christian von Ahlen (Jobleads and Yoom founder)	n.a.	Jobleads, Yoom

Investor	Fund size	Shareholder	Investment Focus	Portfolio (excerpt)
Shortcut Ventures GmbH	USD 52M	Thorsten Rehling, Martin Ostermayer, Dirk Freise	Games, Internet, Mobile, Social Media	SO1, ZenMate, MediaKRaft, tado, sum up
Start 2 Ventures GmbH	n.a.	Bernd Kundrun, Management Taam	Investment in Innovative new Startups	Hanse Ventures, Firal, Toptranslation, Pay with a Tweet, Hausgold, Rebelle, pflege.de,
Tivola Ventures	n.a.	Deutsche Druck- und Verlagsgesellschaft mbH	Sustainable Business Models	utopia.de, Stuffle, avocadostore.de
TruVenturo GmbH	n.a.	Nils Regge, Management Team	Commerce, Marketing, Mobile	Finanzcheck, hometogo, dreamline, videobeat, casamundo
VCmed AG	n.a.	n.a.	Media, Medical	n.a.

Sources: Ernst & Young (2015), Gründerszene (2016), Deutsche Startups (2016), crunchbase (2016)

Some of these companies seem to have another investment focus (e.g. Beaufort Capital or Deutsche Druck- und Verlagsgesellschaft) while others just seem to be entities to bundle equity shares of certain startup founders (e.g. FRW Bach Invest or Schmidt von Ahlen Capital). Most investors seem to focus on seed and early stage investments (e.g. H2-Investments or HackFWD Capital) but some are actively pursuing later stage rounds (e.g. eVentures Capital Partners). In addition some of the investors listed in the Ernst & Young key investor list seem to be rather small companies with doubtful capacities to qualify as a key investors (e.g. SCG Beteiligungs UG) or are not actively investing money at all (e.g. CatCap or Parklane Capital). Furthermore there are investors who are in fact public subsidy entities (e.g. IFB Innovationsstarter) and therefore might not be easily classified as traditional investors. Also there are investors that seem to be of doubtful trustworthiness due to previous misconduct reported²² (e.g. Cleanventure) which might be an important aspect not to include them in a key investor list. Lastly, the typical investment phase of the listed investors often remains a mystery, calling into question the actual category of investors. As all of the listed key investors might be taking high risks by investing in startups with high-growth potential, only few of them might actually be venture capital investors - meaning investing vast amounts of money during the growth stage of a startup's development.

²² Bremer, T., 2015. CLEANVENTURE AG - und der Name Philip Moffat aus Hamburg. *diebewertung.de*. Available at: <https://www.diebewertung.de/cleanventure-ag-und-der-name-philip-moffat-aus-hamburg> [Accessed November 1, 2016]

All in all it remains unclear in which way these investors are key to the Hamburg entrepreneurial ecosystem. Checking individual websites and other data sources for the key investors mentioned by Ernst & Young (2015) was inconclusive in this regard.

Noteworthy might be entities that are represented in both Hamburg Chamber of Commerce (2016a) and Ernst & Young (2015) datasets. Of those, entities such as eVentures Capital Partners, Neuhaus Partners, Shortcut Ventures and IFB Innovationsstarter might be rather high profile venture capital investors in Hamburg's entrepreneurial ecosystem.

Additionally, seed investment activities by previously successful and high profile serial entrepreneurs might be considered as key venture capital investments, most prominently by Lars Hinrichs (founder of XING) and Heiko Huberts (founder of Bigpoint), two of Hamburg most successful high-growth venture entrepreneurs.

All in all, despite some difficulties to identify detailed and credible data on venture capital investments done in Hamburg, a considerable volume of investment deals is reported in Hamburg, as was outlined in chapter 3.2, and those might very well come from national and international investors despite them having no offices in the city.

Public Loan & Subsidy Programs

In addition to the privately owned early stage investment vehicles, there are various public subsidy programs available for entrepreneurs in Hamburg. Most common in public financing programs are loans, equity and grants as well as consulting service allowances. The number of subsidy programs is extensive, with more than 2,000 programs available within the EU and Germany (FÜR-GRÜNDER.DE 2015).

In addition to providing capital and therefore belonging to the finance domain in terms of Isenberg (2011a, 2011b), these subsidy programs are an important part of the policy domain. Not only do they provide financial support in form of research & development funds or tax benefits, many public subsidy programs are linked to research institutes and can provide specific incentives for investments. Additionally these programs can entail non-monetary benefits, such as legal and accounting support or consulting services. Therefore they are also part of the supports domain.

Some of the public subsidy programs are available all over Germany or even internationally. Also the subsidy programs have very different target audiences and objectives. The most prominent programs are listed below.

Gründungszuschuss: Available through the Bundesagentur für Arbeit (Germany's Federal Employment Agency), everyone unemployed or threatened with pending unemployment can apply for subsidies when starting a business or self employment.

EXIST Scholarship: Initiated by Germany's Federal Ministry for Economic Affairs and Energy, the EXIST scholarship is a national support program aimed to foster entrepreneurial activities in Germany by increasing the number and prosperity of knowledge and technology based startups.

High-Tech Gründerfonds (HTGF): Claiming to be Germany's most active and leading seed stage investor, the High-Tech Gründerfonds (HTGF) invests venture capital in technology-driven businesses.

Horizon 2020: The European Commission's Horizon 2020 program claims to be the biggest EU Research and Innovation program with almost EUR 80 billion worth of funding available between 2012 and 2020.

More details about the loan and subsidy programs available on a national and European level will be provided in chapter 4.3.

In addition there are some Hamburg specific public subsidy programs, aimed at local entrepreneurial activity. Again these programs have different target audiences and objectives. The most prominent programs are outlined as follows.

Innovationsstarter Fonds Hamburg: Initiated and operated by the Hamburgische Investitions- und Förderbank (IFB), the Innovationsstarter Fonds Hamburg offers investment opportunities for young, innovative businesses.

InnoRampUp: The special program created by the Hamburgische Investitions- und Förderbank (IFB) provides grants for innovative new firms and existing young companies.

Hamburg-Loan Innovation: The Hamburgische Investitions- und Förderbank (IFB) provides low-interest loans for financing equipment and investments.

BG-Bürgerschaft: Bürgerschaftsgemeinschaft Hamburg (loan guarantee association) offers loan guarantees. Although organised privately, it is publicly available for anyone.

hei. Hamburger Existenzgründungsinitiative: The initiative is supported by the City of Hamburg, Hamburg Chamber of Commerce as well as other entities within the city and is operated by the Bürgerschaftsgemeinschaft Hamburg. It aims to support aspiring entrepreneurs.

Hamburg Chamber of Commerce (2016b) also provides a list with “top” loan programs available in Hamburg through the KfW Kreditanstalt for Wiederaufbau (the largest national business development bank). Some of the loan programs offered might be suitable for startups in Hamburg’s entrepreneurial ecosystem as well (see table 18).

More details about the loan and subsidy programs available on a regional level in Hamburg will be provided in chapter 4.2.

Table 18: KfW loan programs available in Hamburg listed by Hamburg Chamber of Commerce

Program	Who can apply	What it's for	Amount available
ERP Start-up loan (Startgeld)	Start-ups. and small businesses in the area of commercial business and members of the liberal profession (incl. healthcare)	To establish, purchase and have an active investment in a business, including initially as a sideline. Capital investment and equipment with an external financing requirement of max. – 100,000. (equipment share max 30,000)	Up to 100 %, maximum – 100,000, payout 100%, duration up to 10 years, of which two years interest free, 80% exemption from liability by KfW.
ERP Start-up loan (Universal)	Start-ups. and small businesses in the area of commercial business and members of the liberal profession (incl. healthcare)	To establish, purchase and have an active investment in a business, including initially as a sideline. Capital investment and equipment with an external financing requirement of max. – 10 Million	Up to 100 %, maximum – 10 Million, payout 100%, duration up to 20 years, up to three years interest free, backed by normal banking security
Entrepreneur capital ERP capital for start-ups	New start-ups and young businesses up to 3 years after the business started.	To establish, purchase and have an active interest in a business plus consolidation up to three years after the business was founded. Capital investment, purchase price, warehousing, market development costs.	Maximum amount –500.000, if you have up to 15% in personal funds, payout 100 %, scale of interest in the first four years, duration 15 years, 7 years interest free. No securities required. Indemnification.

Table 18: KfW loan programs available in Hamburg listed by Hamburg Chamber of Commerce

Program	Who can apply	What it's for	Amount available
Entrepreneur Loan (Debt capital)	Businesses which were founded more than 3 years ago.	Capital investment, warehousing, takeover, shareholding.	Maximum amount 10 Million for investment, 5 Million for Equipment, payout 100%, indemnification (only for investments) up to 50% possible (only for small sized enterprises), duration up to 20 years, fixed interest rate up to 10 years
Entrepreneur Loan (Subordinated capital)	Businesses which were founded more than 3 years ago.	Capital investment	Maximum amount 4 Million, payout in two equal sized tranches (debt capital tranche and subordinate tranche) 100%, duration 10 years, fixed interest rate 10 years

Sources: Hamburg Chamber of Commerce (2016b)

Evidently, there are various public loan and subsidy programs available, although only few of them seem to be aimed at high-growth oriented startups. Still the number of programs aimed at such business increased over the years, proving ample opportunities to seek public funding for Hamburg based entrepreneurs.

Universities and Research Institutes

The metropolitan area of Hamburg is home to various public and private universities and other higher education facilities.

Obviously, universities and research institutes belong to the human capital domain in terms of Isenberg (2011a, 2011b), since they provide education and degrees to new generations of workers. Over the recent years many higher education institutes have integrated specific entrepreneurship training into their curriculum, propagating an entrepreneurial culture and nurturing distinctive networks for collaboration. Therefore the facilities also belong to the culture and markets domain. In a limited capacity they might also provide financial support and access to research resources for aspiring entrepreneurs, subsequently also belonging to the policy and finance domain as well.

The largest and most prominent public and private universities and research institutes relevant to the entrepreneurial ecosystem in Hamburg are listed below. There are many more, but for the purpose of the research in this thesis it seemed prudent to limit the scope.

University of Hamburg: The University of Hamburg is the largest educational and research institution in Northern Germany and one of the largest national universities as well. Key research areas are climate, energy, nano sciences and health economics among many others. 66 bachelor and 85 master programs are offered for more than 42,000 students (as of 2015)²³. Several fields of study are relevant to high-growth entrepreneurship, such as Economics, Business Administration and Computer Science to name a few. Still none of those list entrepreneurship as a key research area. The university offers consulting to aspiring entrepreneurs through its career center and is closely collaborating with public subsidy programs. Online: uni-hamburg.de

Hamburg University of Applied Sciences (HAW Hamburg): Hamburg University of Applied Sciences is an interdisciplinary university and practice-oriented research institute with a focus on Engineering & Computer Science, Life Sciences, Design, Media & Information and Business & Social Sciences. With more than 16,000 students and 62 degree programs it is the second largest institution for higher education in Hamburg²⁴. Several fields of study are relevant to high-growth entrepreneurship, such as Engineering & Computer Science, Business, Media Technology and Information to name a few. Although none of the departments list entrepreneurship or related topics as key research area, interdisciplinary seminars on entrepreneurship are offered and various labs work on startup methodology as well as business ideas for potential spin-offs. In addition to coaching and workshops provided by the career center, the university offers a Gründerwerkstatt (startup lab), where aspiring students and entrepreneurs can work on their business ideas in university offices. Some of the startups supported Hamburg University of Applied Sciences are myFOOD!, audioguideme, THREAKS and 18frames. Additionally the university operates several research labs that could be considered relevant to the

²³ University of Hamburg, 2016. Facts and figure. *uni-hamburg.de*. Available at: <https://www.uni-hamburg.de/en/presse/medieninformationen/0-u-1351687109-u-1353442938.html> [Accessed: November 22, 2016]

²⁴ Hamburg University of Applied Sciences, 2016. Facts & figures. *haw-hamburg.de*. Available at: <https://www.haw-hamburg.de/english/about-us/facts-figures-films.html> [Accessed November 22, 2016]

entrepreneurial ecosystem, such as the Living Space Lab or the Creative Space for Technical Innovations. Online: haw-hamburg.de

Hamburg University of Technology (TUHH): Hamburg University of Technology is a university with a focus on research in fields such as Green Technologies, Life Science Technologies, Aviation and Maritime Systems. The university offers 14 bachelor and 28 master degree programs to more than 7,000 students as of 2015²⁵. Several fields of study are relevant to high-growth entrepreneurship, such as Engineering, Computer Science and Management. With its Startup Dock program the university offers entrepreneurship specific education at the gateway between technology and entrepreneurship (see below). In addition a joint master degree program in Entrepreneurial Management is offered in conjunction with the Northern Institute of Technology Management Hamburg (NIT)²⁶. Online: tuhh.de

Hamburg Media School: Hamburg Media School is partly owned by the HMS Hamburg Media School Foundation, the City of Hamburg, the University of Hamburg and Hamburg University of Fine Arts (HFBK). 4 master degrees are offered (ranging from Digital Journalism to Film and Media Management) to a very select group of applying students. Additionally the university is operating the TIDE TV, a community and educational tv broadcasting channel. Although entrepreneurship is not mentioned specifically in the study and research fields, many entrepreneurship related topics are integrated in the curriculum. Within the Digital Journalism program a prominent partnership with the Tow-Knight Center for Entrepreneurial Journalism (CUNY - The City University of New York) is advertised²⁷. More recently, the Media Management program integrated a startup track into its curriculum, preparing aspiring entrepreneurs for potential business formations in cooperation with betahaus Hamburg²⁸. Online: hamburgmediaschool.com

²⁵ Hamburg University of Technology, 2016. Key Data 2015. *tuhh.de*. Available at: <https://www.tuhh.de/alt/tuhh/university/information/key-data.html> [Accessed November 22, 2016]

²⁶ Hamburg University of Technology, 2016. NIT's Entrepreneurial Management Track *tuhh.de*. Available at: <https://www.tuhh.de/startupdock/education-amp-research/nits-entrepreneurship-track.html> [Accessed November 22, 2016]

²⁷ Hamburg Media School, 2016. Inhalte & Ablauf. *hamburgmediaschool.com*. Available at: <http://www.hamburgmediaschool.com/studium/digital-journalism-emaj/inhaltundablauf/> [Accessed November 22, 2016]

²⁸ Hamburg Media School, 2016. NEU an der HMS. *hamburgmediaschool.com*. Available at: <http://www.hamburgmediaschool.com/studium/medienmanagement-vollzeit-mba/inhalte-ablauf/start-up-track/> [Accessed November 22, 2016]

Henri Nannen School: The private journalism school is operated by Hamburg based publishing companies Gruner + Jahr, DIE ZEIT und DER SPIEGEL and named after former Stern magazine's chief editor Henry Nannen. It offers specific media industry and journalism training in a 18 month program aimed at young people new to the industry. The training is free of charge and is subsidised with EUR 794 per month for the student. Although not specific to entrepreneurship, the media industry driven curriculum might be closely linked to many potential business models for startups within the Hamburg entrepreneurial ecosystem. Online: journalistenschule.de

Bauer Media Group School of Journalism: The privately operated journalism school offers three distinct training courses in content, photography and layout. The program lasts for 2 years and is aimed at trainee journalists with an interdisciplinary curriculum. In addition 2 bachelor degrees are offered by Bauer Media Group in collaboration with Fachhochschule NORDAKADEMIE (University of Applied Sciences), although enrolled students are not considered part of the journalism school. Online: bauermedia.com/en/jobs-career/bauer-media-academy/school-of-journalism/

Macromedia University of Applied Sciences: With a strong focus on media society, the privately operated university offers courses of study ranging from Management to Journalism and creative fields like Design, Gaming and Television. 6 bachelor and 8 master degree programs are offered to more than 2,000 students at media centres in Munich, Stuttgart, Cologne, Berlin and Hamburg. Among the master degree programs is a Digital Entrepreneurship track aimed at creative entrepreneurs specifically²⁹. Although the track is only available in Berlin, the university provides many seminars and workshops relevant to entrepreneurship at all locations and in various fields of study. Online: mhmk-international.org

There are many more privately operated universities offering training related to entrepreneurial activity or the media industry in Hamburg, such as ARD.ZDF Medienakademie, Die Medienakademie, Deutsche Pop Akademie, Europäische Medien- und Business-Akademie (EMBA), SAE Institute and many others. In terms of size and impact these do not seem to be particularly relevant to the research in focus of this thesis.

²⁹ Macromedia University of Applied Sciences, 2016. Study Digital Entrepreneurship (M.A.). *mhmk-international.org*. Available at: <http://www.mhmk-international.org/master/digital-entrepreneurship-ma.html> [Accessed November 22, 2016]

Of special note might be the Medien-campus Finkenau, a union association of several higher education institutes in Hamburg. Opened in 2010, the organisational and spatial consolidation of several education entities in Hamburg with focus media subjects opened its doors. It is home to Hamburg University of Applied Sciences Department of Design, Media and Information (DMI), Hamburg University of Fine Arts (HFBK) and private universities Hamburg Media School, Miami Ad School as well as local tv broadcaster TIDE TV (Hamburg Chamber of Commerce 2015b).

There are several specific programs offered by some of the public universities that are aimed at entrepreneurs. The most prominent are listed below.

Hamburg Innovation (HI): Owned partly by all public Hamburg universities, Hamburg Innovation (HI) is a private company assigned with technology and knowledge transfer through technological and scientific cooperations and projects between industry and university. In addition Hamburg Innovation (HI) is licensing results of research & development efforts to interested parties and supports new firm formation as spin-offs. Advanced trainings and qualifications are also offered, ranging from small events and two-day workshops to extended perennial programs at local universities. TUTECH is mentioned as an affiliate company of Hamburg Innovation. Online: hamburginnovation.de

TuTech Innovation (TUTECH): TuTech Innovation GmbH (TUTECH) is a private company supporting Hamburg University of Technology (TUHH) since 1992. It is aimed at promoting transfer and exploitation of academic knowledge for economic and societal benefits. The services offered range from research management and IP management to startup support and consultancy. Startup Dock is mentioned specifically as a cooperation partner. Online: tutech.de

InnovationsCampus Green Technologies (ICGT): Closely linked to Hamburg University of Technology (TUHH), the program is meant to support green and digital technologies. In collaboration with TUTECH and Startup Dock the programs aims to support business formation at a very early stage, arguably closing the gap to established financing models available in Hamburg. The InnovationsCampus Green Technologies has been discussed over a longer period of time and plans to finally open its doors in late 2016³⁰. Online: tutech.de/icgt

³⁰ Behörde für Wissenschaft, Forschung und Gleichstellung Hamburg, 2016. InnovationsCampus Green Technologies (ICGT) soll noch in diesem Jahr starten. <http://www.hamburg.de/pressearchiv-fhh/4792622/2016-02-03-bwfg-innovationscampus/> [Accessed November 22, 2016]

Startup Dock (TUHH): Although based at Hamburg University of Technology (TUHH), the Startup Dock Hamburg aims to nurture successful business formations at all public Hamburg based universities and research institutes. With dedicated training, e.g. a 12 week entrepreneurship seminar, offered to students and researchers, entrepreneurial concepts are taught to inspire aspiring entrepreneurs. As a founding support entity the Startup Dock assists innovative, technology based startups only. Founded in 2013, the program offers coaching, mentoring and financial support through the Zentrum für Innovation & Entrepreneurship (ZIE) as well as educational and research perspective within the technology and innovation field through the TUHH Institute of Entrepreneurship (TIE). The Hamburg University of Technology (TUHH) aims to connect important industry stakeholders with university researchers and to propagate an entrepreneurial culture³¹. Among other initiatives the university also offers a 1 week summer school for master students interested in entrepreneurship, during which interdisciplinary teams develop and validate business ideas³². Online: startupdock.de

CSTI Creative Space for Technological Innovation (HAW Hamburg): Meant as a platform for computer science, media and culture studies as well as design and art, the interdisciplinary lab provides an environment to work on innovative ideas and prototypes since 2016. With a research focus on human-computer-interaction and user-experience the creative space plans to be a gateway between research & development, spin-offs and education for small and medium-sized enterprises (SMEs)³³. To facilitate knowledge transfer and collaboration, dedicated lab space, tools, technologies and corresponding mentoring services are provided to interested students and industry entities. Online: csti.haw-hamburg.de

Evidently Hamburg University of Technology (TUHH) is the most active entity in regards to entrepreneurship at Hamburg based universities. Although other universities do not proactively integrate entrepreneurial research fields, all show some specific agendas to foster entrepreneurship.

³¹ Hamburg University of Technology 2016. Startup Dock. *tuhh.de*. Available at: <https://www.tuhh.de/startupdock/startup-dock.html> [Accessed November 22, 2016]

³² Hamburg University of Technology 2016. Startup Sprint. *tuhh.de*. Available at: <https://www.tuhh.de/startupdock/education-amp-research/programm-fuer-studierende.html> [Accessed November 22, 2016]

³³ Hamburg University of Applied Sciences, 2016. Was ist das Creative Space for Technical Innovations (CSTI)?. *csti.haw-hamburg.de*. Available at: <http://csti.haw-hamburg.de/projekt/> [Accessed November 22, 2016]

Public and Private Service Providers

In addition there are several additional public and private service providers for Hamburg based startups, supporting the ecosystem with information, coaching, workshops and consulting.

In terms of Isenberg (2011a, 2011b) these service providers are important entities in the supports and culture domain since they provide access to advisors, industry experts etc. and promote innovation and entrepreneurship and therefore actively contribute to changing social norms surround risk, failure, innovation and experimentation. Some of the public service providers are also linked to the policy domain and provide a platform for entrepreneurship strategy and government institutions and financial support efforts.

The most prominent public and private service providers in Hamburg and their relevance to the entrepreneurial ecosystem are listed below.

nextMedia.StartHub: The nextMedia.StartHub offers networking with both public and private partners at startup events. In addition it provides information around startup related topics and propagates transparency within Hamburg's entrepreneurial ecosystem. The nextMedia.Starthub will be discussed in greater detail as part of the nextMedia.Hamburg introduction in chapter 4.1. Online: nextmedia-hamburg.de/startups/starthub

Hamburg Chamber of Commerce (Handelskammer Hamburg): Hamburg Chamber of Commerce offers free information and workshops on entrepreneurship and related topics as well as a founding lab and other consulting services. Online: hk24.de/unternehmensfoerderung_und_start

Hamburgische Investitions- und Förderbank (IFB): The Hamburgische Investitions- und Förderbank (IFB) offers information and consulting on IFB subsidy programs outlined above and other means of private or public funding. Online: ifbhh.de/beratungscenter/ifb-beratungscenter-wirtschaft

hei. Hamburger Existenzgründungsinitiative: The privately operated Hamburger Existenzgründungsinitiative offers free initial consulting as well as individual coaching for aspiring entrepreneurs. In addition subsidies might be granted for qualifying founders as mentioned above. Online: hei-hamburg.de

Hamburg Kreativ Gesellschaft: Hamburg Kreativ Gesellschaft is an institution of the City of Hamburg, aimed to facilitate the development of creative industries, such as architecture, design, film, music, press, radio, software/games and advertising among others. It provides coaching and organises workshops and events as well as procurement of office space for self employed freelancers. There is no specific focus on high-growth startups. Online: kreativgesellschaft.org

Large Corporations

According to Hamburg Chamber of Commerce (2015a) the largest corporations in the Hamburg metropolitan area in terms of employees are in industries such as aviation & mobility, commerce & logistics and banking & insurance (see table 19).

All of these might be important fields of interest for Hamburg based startups. Innovative business ideas are disrupting established value chains in all of these industries.

This is substantiated by activities of some of these corporations outlined above, such as the Airbus Bizlab, comdirect Startup Garage or Liquid Labs. Corporations such as Deutsche Bahn AG and Deutsche Lufthansa AG also operate similar innovation labs or accelerator programs in Berlin.

Interestingly, none of the top 50 corporations in terms of number of employees is a media corporation. Bauer Media Group ranks at 53, Goodgame Studios at 73 and Spiegel Gruppe at 92 (Hamburg Chamber of Commerce 2015a). This might in fact indicate that other industry clusters with potential for radical innovation and transformation might be of bigger relevance to the entrepreneurial ecosystem than the media industry itself.

In addition there are many prominent international technology-driven corporations based in Hamburg that might be considered as important stakeholders within the entrepreneurial ecosystem. They provide access to likeminded people, networking, technological knowledge and infrastructure, as well as nurture the entrepreneurial culture in the metropolitan region. The most relevant corporations surely are Google, Facebook, Twitter, Airbnb, Dropbox and established industry giants such as IBM and Microsoft among many others.

Table 19: The largest corporations in terms of employees in the Hamburg metropolitan area

Rank	Corporation	Employees	Location
1	Airbus Operations GmbH	12,500	Hamburg
2	Asklepios Kliniken GmbH	12,300	Hamburg
3	Deutsche Lufthansa AG	9,500	Hamburg
4	Otto Group	8,605	Hamburg
5	Deutsche Bahn AG	8,450	Hamburg
6	DMK Deutsches Milchkontor GmbH	7,158	Zeven
7	Deutsche Post AG	6,500	Hamburg
8	„Elbkinder“ - Vereinigung Hamburg Kitas gGmbH	5,678	Hamburg
9	EDEA Verbund	5,600	Hamburg
10	Hamburger Sparkasse	5,000	Hamburg
11	Drägerwerk AG & Co. KGaA	4,956	Lübeck
12	Beiersdorf AG	4,900	Hamburg
13	Hamburger Hochbahn	4,861	Hamburg
14	Bockholdt-Gruppe	4,381	Lübeck
15	Elbe Werkstätten GmbH	3,914	Hamburg
16	Hamburg Hafen und Logistik AG	3,625	Hamburg
17	Signal Iduna	3,206	Hamburg
18	Philips GmbH Market DACH	3,200	Hamburg
19	Rewe Markt GmbH	3,007	Hamburg
20	Vattenfall GmbH	3,000	Hamburg
21	Ergo Versicherungsgruppe AG	2,863	Hamburg
22	Kühne+Nagel (AG&Co.)KG	2,800	Hamburg
23	Körber AG	2,748	Hamburg
24	Jungheinrich AG	2,646	Hamburg
25	Commerzbank AG	2,600	Hamburg
26	Daimler AG	2,600	Hamburg
27	Olympus Europa SE & Co. KG	2,500	Hamburg
28	Siemens AG	2,400	Hamburg
29	STILL GmbH	2,395	Hamburg
30	Westküstenklinik- um Brunsbüttel und Heide gGmbH	2,352	Heide

Source: Hamburg Chamber of Commerce (2015a)

Initiatives and Advocacy Groups

There are various initiatives and advocacy groups active in Hamburg, trying to connect Hamburg's startups, investors and old economy players. Usually these community groups have a broader audience of specific digital professionals and do not necessarily focus on the entrepreneur per se.

Again, in terms of Isenberg (2011a, 2011b), these groups are focused on the supports and culture domain since they advocate entrepreneurship, tolerance of risk as well as potential for wealth creation. In addition they provide a platform for the human capital domain and allow skilled and unskilled workforce to connect, interact and collaborate.

Some of the most prominent initiatives and advocacy groups in Hamburg are listed below.

Hamburg@Work e.V.: The Hamburg@Work informs and connects both companies and individuals within the digital economy in Northern Germany. It's goal is to support the digital transformation in various industries. The network supports the nextMedia.Hamburg initiative as well as projects surrounding topics such as logistics, eCommerce, health, FinTech among others. Online: medianet.hamburg

Gamecity:Hamburg: Gamecity:Hamburg is a dedicated network for the games industry, supporting game development companies since 2003. With over 2,000 members the networks provides services to interested companies and organises events, exhibitions and industry trainings to facilitate knowledge transfer within the industry. Online: nextmedia-hamburg.de/initiative/gamecityhamburg

Hamburg Startups: Hamburg Startups is a private initiative, supporting the Hamburg startup community with news, events, consulting services and networking opportunities. In addition the initiative created a database of local startups and provides "live" data on the entrepreneurial ecosystem in Hamburg with its Startup Monitor. Online: hamburg-startups.net

#DMV - Digital Media Women: Digital Media Women (#DMV) is a dedicated networking association for women in the digital industry. In addition to advocating women's equality in business fields such as conferences, media or management, the network organises educational events, workshops and training with its #DMV Academy. Online: digitalmediawomen.de

Geekettes: Geekettes is an international organisation and network for women working in digital or technology industries. It provides industry news, private discussion groups and organises events. In addition to Hamburg and Berlin, the network is active in many other cities around the globe, such as Berlin, London or New York City. Online: geekettes.io/cities/hamburg

There are many other private initiatives and advocacy groups related to entrepreneurial activities in Hamburg. Since it is doubtful that they have any substantial relevance to the scope of the research in the thesis, the list remains limited to the entities listed above.

Events & Festivals

Events & Festivals are also an important aspect of the entrepreneurial ecosystem, since they allow entrepreneurs to connect both locally and globally while exchanging knowledge. These events range from large festivals with a broad generic audiences to very niche and industry specific entrepreneurial conferences.

In terms of Isenberg (2011a, 2011b), events and festivals belong the supports domain since they promote entrepreneurship on a larger scale. Within the culture domain the tolerance of the risk and the potential of innovation, creativity and experimentation as well as visible success is emphasised. Events might also provide insights into government and leadership issues and might be a platform to reshape policy agendas within the policy domain. In addition they can be an interesting platform for early adopters and customers as well as international networks, therefore also belonging to the markets domain. Within the human capital domain, specific events might provide training in entrepreneurship skills.

Some of the most prominent events and festivals taking place in Hamburg on a regular basis are listed below.

Hamburger IT-Strategietage: Hamburger IT-Strategietage is an annual congress for CIOs and IT executives in Germany. Organised by Hamburg@Work and marketing agency Faktor3 in collaboration with CIO magazine, it focusses on strategies for the digital transformation in all industries. It claims to be the largest IT management congress in Germany and also offers pitch opportunities for startups offering B2B products or services within the IT industry with its “Startup-Call” event during the congress. Online: it-strategietage.de

Hamburg Innovation Summit (#HHIS): The Hamburg Innovation Summit is a fair, conference and bar camp for regional industry, university and politics. It aims to advertise local startups and young businesses to expert audiences, media outlets and the public. With its “Future Candy Expo”, innovative technologies are available for exploration and a “Hamburg Innovation Award” is presented. In Masterclasses and Barcamps trends and developments within the technology sphere are discussed and presented. A triple helix approach is mentioned specifically on the website, trying to connect stakeholders from policy, university and industry. Online: hamburg-innovation-summit.de

Solutions.Hamburg: Solution.Hamburg is an annual congress organised by Hamburg IT service provider Silpion IT-Solutions. With more than 150 exhibitors, 500 expert speakers and 2,500 visitors it is one of the largest IT conferences in Germany. It focusses on discussions of digital transformation from an IT perspective. Online: solutions.hamburg

Code.Talks: Code.Talks is one of the largest developer conferences in Europe with more than 1,500 developers attending. The annual community conference aims to be different from conference organised by profit oriented corporations and focusses on developer centric topics. Since 2011 startups and major IT corporations report and discuss current trends and topics in web development. Online: codetalks.de

Scoopcamp: Scoopcamp is an annual innovation conference organised by the nextMedia.Hamburg initiative in collaboration with dpa. It is aimed at journalists and media producers and focusses on topics such as “data journalism”, “social media” and “new storytelling”. In various formats trends and issues between content, technology and product development are discussed. Online: scoopcamp.de

ADC Festival: The ADC Festival organised by the Art Directors Club für Deutschland e.V. is an annual congress and festival of the German creative industry. Beneath networking opportunities and current topics being discussed, most importantly the ADC awards (ADC nails) are presented. In an exhibition the most original works created during the year are presented. The ADC awards are one of the most important awards for the creative ranking within the advertising industry. Online: adc.de/festival

Next Conference: Next Conference is an annual international conference organised by digital advertising agency Sinner Schrader and marketing agency Faktor3 with about 1,300 people attending. Since 2006 it focuses on the discussion of challenges

and opportunities within the digital transformation and caters towards marketing and product leaders, digital economy executives and innovative corporations and startups. Online: nextconf.eu

Online Marketing Rockstars: Online Marketing Rockstars is an annual international conference, festival and expo for online marketing experts and solution providers. Since the first festival in 2010 it grew to over 16,000 visitors in 2015. The event has attracted prominent keynote speakers such as BuzzFeed founder Jonah Peretti, Pinterest founder Evan Sharp, and Wired founder John Battelle. More than 200 companies providing solutions for ad tech and digital marketing are on exhibition during the expo. Online: onlinemarketingrockstars.com

Social Media Week: Social Media Week is the largest free social media conference in Germany with a strong focus on digital transformation. The annual conference is also held in other cities around the world, such as London, Los Angeles, Mexico City, Miami, New York, Rotterdam and many others. The conference aims to explore how humans interact with technology and how it changes the way people live and work. Online: socialmediaweek.org

Reeperbahn Festival: Reeperbahn Festival is Germany's largest annual club festival and evolved into one of the most important meet ups for the music industry worldwide since 2006 with more than 38,000 people attending. With 750 events and more than 500 concerts the festival and conference advertises toward professionals in the music industry as well as in associated digital industries. With various talks, panels, keynotes, workshops and networking opportunities it is one of the most important events in Hamburg's entrepreneurial ecosystem and many other events organise their timetable parallel to the event. In 2016 an additional Reeperbahn Festival was organised in New York City due to the importance of the U.S. market for the music industry. Online: reeperbahnfestival.com

NewTV Kongress: The NewTV Kongress, organised by the nextMedia.Hamburg initiative, is an annual congress about the future of TV. Leading industry professionals and executives from both content producers and marketers meet to discuss formats, technologies, distribution and changing markets. Online: newtv-kongress.de

Webfuture Award: The Webfuture Award, organised by the nextMedia.Hamburg initiative, is an annual award event for the best digital startup from the metropolitan area of Hamburg. The award is aimed at local entrepreneurs and offers the

opportunity to present their business idea to a jury of experts. In addition to expert feedback and networking opportunities at price money of EUR 5,000 is awarded to the winning startup. Online: nextmedia-hamburg.de/events/eigene-events/webfuture-award

Startup Weekend: Startup Weekend is an event powered by Google for Entrepreneurs. It offers a workshop to build a startup over the course of one weekend for interested professionals working in design, development and marketing industries. The latest event took place in June 2016, a new Startup Weekend is still to be announced. Online: up.co/communities/germany/hamburg/startup-weekend

12min.me: 12min.me is a event program aimed at interested digital professionals and entrepreneurs. It hosts short talks (12 minutes) on technology and business topics with a focus on health and FinTech. Online: 12min.me

Webmontag: Webmontag is a monthly event and networking format with talks on development within the digital industry. The event is organised through a discussion group in the business network XING and a newsletter. Online: webmontag-hamburg.de

Although Hamburg's entrepreneurial ecosystem might still leave a lot to desire when compared with Berlin or more international hotspots such as London, New York or Silicon Valley, it has a well developed startup community and continues to thrive on a year to year basis. Among many other contributing factors, this is due to the continuing efforts by public policy makers and industry advocacy groups in Hamburg.

4 Public Policy towards Entrepreneurship in Hamburg

The City of Hamburg outlined the regional innovation policy in its 2014 document “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 (Untiedt 2014). The document can be taken as the general approach by the regional government towards entrepreneurship in Hamburg. The overarching strategy aims to further the local economy, its innovative potential and its international competitiveness by strengthening the networks between industry, university and public sectors. Cornerstones of the strategy implementation are listed below.

Innovation Climate:

Measures are meant to nurture an innovative culture, create transparency about relevant contacts and networks as well as consulting services offered. Marketing activities are supposed to enhance the external visibility of the innovative location Hamburg. Curiosity and the spirit of innovation and entrepreneurship are to be strengthened and potential innovators need to be able to access necessary resources quickly and efficiently (Untiedt 2014).

Need for action in regards to innovation climate is outlined as follows:

- provide current and reliable information in a user friendly and transparent way
- actions to explore improvements in every-day, high-technology and knowledge intensive sectors need to be defined to inspire potential innovators' interest
- communication processes need to be configured to facilitate innovative collaboration between several partners; strategic alignment of Hamburg based companies should be supported

Operational measures are mentioned without providing any detailed information in regards to objectives, timing or implementation strategy. Still, they are prominently featured in the document. In regards to innovation climate, operational measures are:

- Innovation Portal
- Marketing Hamburg as Innovation Location
- Central Research Information System

Education:

Measures are meant to satisfy current and future demand for a skilled workforce in both quantity and quality. In addition knowledge management and cooperations in education and training are to be nurtured and research activities at local universities are to be intensified. Dual study programs in conjunction with industry training are deemed effective and are to be extended. Future demand for skilled experts needs to be explored and articulated to effectively develop study programs at local universities with a special focus on interdisciplinary qualification (Untiedt 2014).

Need for action in regards to education is outlined as follows:

- effective and intensive cooperation between university and industry is to be secured through both scientific and practice oriented university programs
- means for advanced training and qualifications need to be scientific, sustainable und market-driven in terms of Hamburg industry clusters
- interdisciplinary competencies are to be nurtured at local universities to secure innovative talent for future exploitation of innovative potentials

Operational measures are mentioned without providing any detailed information in regards to objectives, timing or implementation strategy. Still, they are prominently featured in the document. In regards to education operational measures are:

- Advanced learning laboratories
- Transparency about setup of advanced learning opportunities
- Enhancement of permeability in education areas
- Intensification of marketing efforts

Transfer:

Measures are meant to strengthen cooperations for research & development efforts and to create good surrounding conditions for networks, groups and future initiatives to facilitate transparent and efficient knowledge transfer between industry and research institutes as well as academic studies and training. Complementary knowledge and skills need to be made available in both directions (to and from university and industry) and in a structured manner, improving the chance to utilise knowledge spillover. Small and medium-sized enterprises (SMEs) in particular need to be integrated in cooperation networks. Additionally conditions for spin-offs created through research at local universities are to be improved (Untiedt 2014).

Need for action in regards to transfer is outlined as follows:

- networks for specific innovative topics are to be created and nurtured to connect industry and university stakeholders as well as financial entities
- increased industry engagement in scientific research is to be secured by adapting key research priorities to areas of interest to Hamburg based businesses
- demand and supply of knowledge need to be proactively brokered between interested stakeholders in university and industry

Operational measures are mentioned without providing any detailed information in regards to objectives, timing or implementation strategy. Still, they are prominently featured in the document. In regards to transfer operational measures are:

- Innovation Contact Point (Innovations Kontakt Stelle IKS)
- Research meets industry
- Specific network initiatives

Subsidies:

Measures are meant to create an efficient subsidy system and means of controlling subsidised innovation projects organised by corporations and research institutes as well as entrepreneurs. The existing subsidy program is to be extended to match the evolving demand in both industry and research. Transparency about subsidy programs needs to be improved, double subsidies need to be avoided. Short term options and means of financing for startups as well as small and medium-sized enterprise (SMEs) need to be improved. Used financial means should result in an appropriate contribution to Hamburg's innovative capacities and accelerate the go to market process for innovations (Untiedt 2014).

Subsidies are to be targeted at entrepreneurs, corporations, universities and research facilities as well as cooperations between them (see fig. 16). In addition the subsidy system should provide instruments for consulting, networking, coaching, culture and infrastructure (Untiedt 2014).

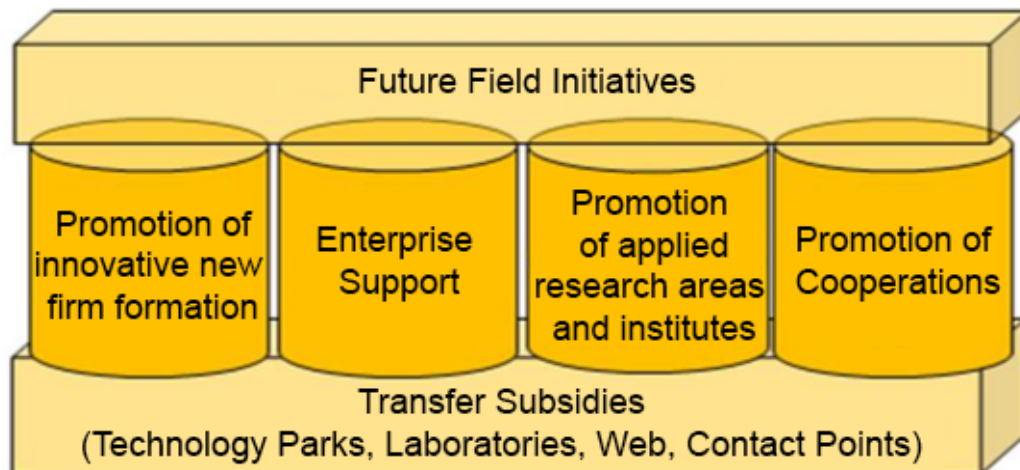


Figure 16: Hamburg subsidy system

Need for action in regards to subsidies is outlined as follows:

- subsidy programs need to be simplified and adjusted to market needs
- subsidy system needs to provide actionable metrics to measure increased innovative activity and successful application
- integrated in federal subsidy programs, regional programs need to accentuate regional specifics

Operational measures are mentioned without providing any detailed information in regards to objectives, timing or implementation strategy. Still, they are prominently featured in the document. In regards to subsidies operational measures are:

- Investment funds
- Entrepreneurship aid program InnoRampUp
- Establishment of innovation agency within IFB
- Standard subsidy directives for innovation in Hamburg
- Hamburg consulting standards

Infrastructure:

Measures are meant to sustain and extend appropriate facilities for practice oriented research & development and to establish or develop topic specific technology parks for entrepreneurs, young technology-driven companies and research institutions as well as established businesses. Hamburg based corporations and research institutes are to be better connected on a daily basis in order to reduce costs for cooperations (Untiedt 2014).

Need for action in regards to infrastructure is outlined as follows:

- spatial proximity between university and industry needs to be increased by implementing technology parks for collaboration and entrepreneurial activity
- practice oriented research institutes need to be extended
- workforce and equipment should be provided by research institutes to small and medium-sized enterprises (SMEs) to facilitate easy access to research capacities

Operational measures are mentioned without providing any detailed information in regards to objectives, timing or implementation strategy. Still, they are prominently featured in the document. In regards to infrastructure operational measures are:

- Research & Innovation parks
- Establishment of Fraunhofer Institute
- Extension of practise oriented research & development

The specific operational measures outlined in the document (Untiedt 2014), compose a rather complex policy mix for the various strategic objectives with concrete implementation projects being at different stages of completion (see fig. 17).

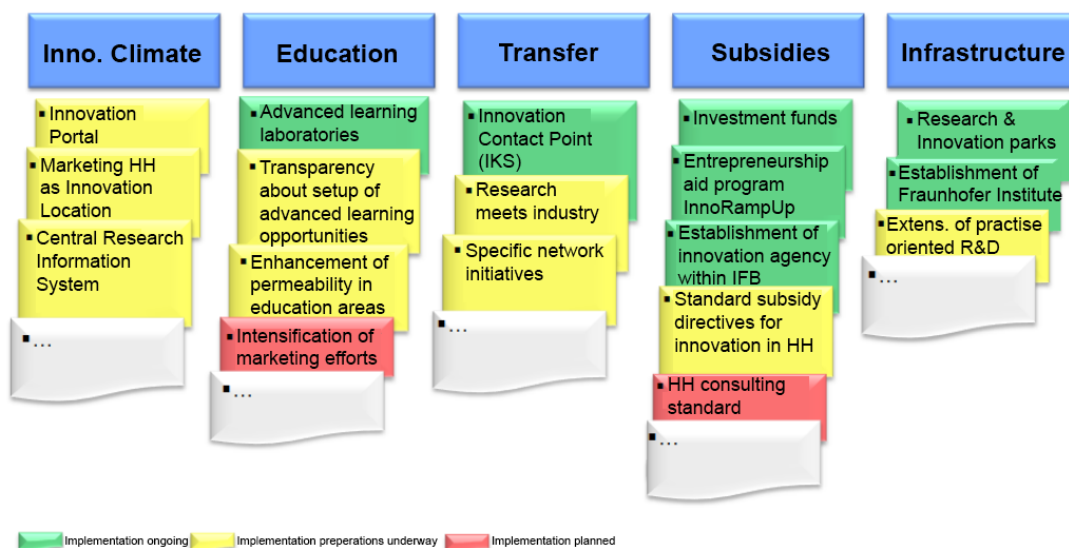


Figure 17: Strategic corner stones and operational measures in Hamburg's regional innovation strategy 2020

The City of Hamburg lists four established and four young industry clusters in the strategy document that are meant to be developed for the future (Untiedt 2014):

- Cluster Erneuerbare Energien Hamburg (EEHH) [renewable energy]
- Cluster Gesundheitswirtschaft Hamburg (GWHH) [healthcare]
- Cluster Hamburg Kreativ Gesellschaft (HKG) [creative industry]
- Luftfahrtcluster Hamburg Aviation (HAv) [Aviation]
- Logistikinitiative Hamburg (LIHH) [logistics]
- Cluster Life Science Nord (LSN) [life science]
- Maritimes Cluster Norddeutschland (MCN) [maritime]
- Cluster Medien/IT (nextMedia.Hamburg) [media/IT]

The media/IT cluster is one of the established clusters according to the strategy document and the main focus of the research in this thesis due to its proclaimed strong connection to entrepreneurial activity and high-growth ventures.

4.1 nextMedia.Hamburg Initiative

nextMedia.Hamburg is an initiative announced in 2014 that spawned out of the public-private partnership Hamburg@Work e.V. founded in 1997 and is responsible for managing the network activities within the local media and IT industry. It is supported by the city's senate and industry members and aims to chaperon the transformation of the media and digital industry by strengthening the content & technology sector and connecting relevant stakeholders as well as improving conditions for new startup formation specifically (Senatskanzlei Hamburg 2014).

The initiative aspires to enable the development of new applications, content types and markets within the newly developed digital ecosystems. The leading position within the German and European media landscape is meant to be extended by utilising innovative potentials for new business models in the ongoing digital transformation of the media industry (Untiedt 2014). Interestingly, the term "media" is specifically defined as a broad term for anyone in content related industries.

nextMedia.Hamburg offers various services, such as information, industry scouting, consulting, networking and event management in 3 fields of activity - Service & Support, Publishing and Networking - and claims to be a starting point for anyone interested in innovation or startup activity within the local media/IT industry or the region in general (nextMedia.Hamburg 2014).

Unfortunately no comprehensive document outlining specific services and activities by the nextMedia.Hamburg initiative is available. The website - nextmedia-hamburg.de - and linked newspaper and magazine articles as well as integrated videos remain vague und unspecific in terms of the underlying strategy and operational implementation. Still lots of specific information, infographics and activities can be found. The seemingly most relevant are categorised by the initiative's fields of activity and listed below.

Activity Field: Service & Support

The nextMedia.Hamburg initiative provides lots of information in regards to Hamburg as location for business by citing industry performance data and introduces important partners and stakeholders within the government as well as relevant contacts for interested parties on its website. A dedicated team and corresponding contact information is presented with 3 persons at the Senatskanzlei Hamburg (senat office), 4 persons at the HWF Hamburgischer Gesellschaft Wirtschaftsförderung mbH (Hamburg Business Development Corporation) and 2 persons at Hamburg@Work (e.V.). Additionally 9 advisors from Hamburg based media companies, advocacy groups and universities are introduced with extended profiles but without direct contact information.

Special attention is given to the games sector in particular by naming relevant players, referencing industry reports on employment and providing infographics, illustrating favourable developments over the recent years (see fig 12).

Even more attention is given to startups with a dedicated section in the main menu of the website. A special nextMedia.StartHub team of 2 persons provides a one stop starting point for interested parties in the local startup economy. An extensive and interactive infographic (see appendix 1) illustrates salient points of the entrepreneurial ecosystem and advertises Hamburg as a prime location for innovative startups. A startup brochure is integrated and industry reports such as the Hamburg Startups Monitor, KfW Startup Monitor and Deutsche Start-up Monitor are linked.

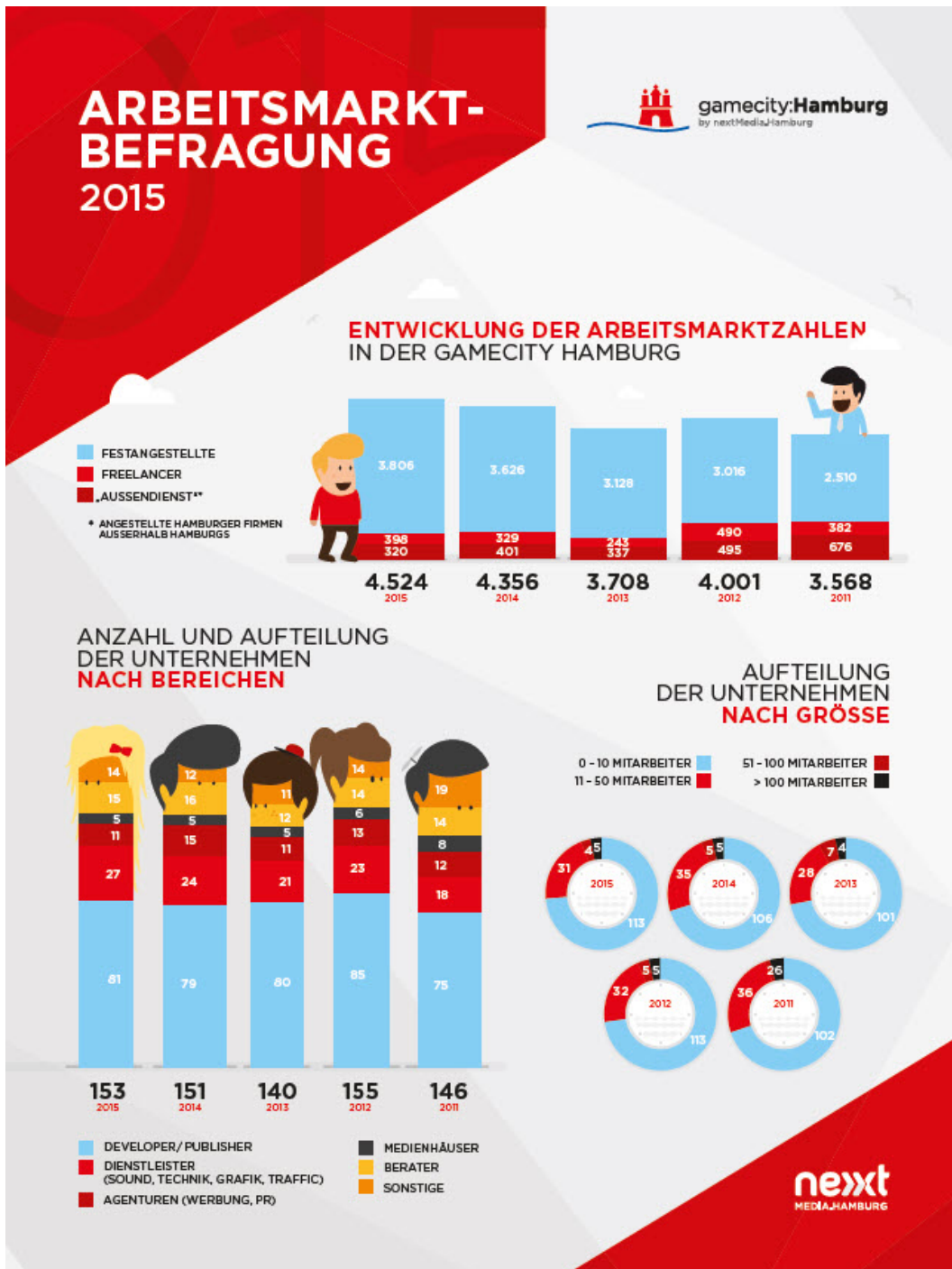


Figure 18: Infographic on employment data within the games industry in Hamburg by nextMedia.Hamburg

The nextMedia.Startup team offers a free consultation hour every week for interested parties, providing information about services offered by the city. In startup workshops organised in collaboration with betahaus Hamburg, current issues within the entrepreneurial ecosystem are introduced and discussed. The Starter Kit within the startup section of the website provides an ample overview over topics relevant to startups and other interested parties. Following topics are integrated:

Business plan: The section provides general information about the formulation of business plans as well as access to specific consulting services & software tools offered by entities such as the Hamburg Chamber of Commerce or the Federal Ministry of Economic Affairs and Energy.

Foundation: The section provides in-depth information about legal forms and types of business ownership, processes, taxes, deadlines, rights and responsibilities. Support is offered through Hamburg Chamber of Commerce as well as other entities such as Bucerius Law School and Hamburg Notarkammer (notary association). Tools and software offered by the Federal Ministry of Finance among others are linked as well.

Financing: General information about startup financing are provided and consulting services offered by Hamburg Chamber of Commerce, Hamburg Kreativ Gesellschaft and hei. Hamburger Existenzgründungsinitiative are introduced. Public subsidy programs are linked, most of which have already been introduced in chapter 3.2. In regards to venture capital investors the website references Hamburg Chamber of Commerce as well a BVK - Bundesverband Deutscher Kapitalgesellschaften - e.V. (German Private Equity and Venture Capital Association)³⁴, the NOAH15 Fund Book³⁵ and the Business Angels Netzwerk Deutschland³⁶. Interestingly a special INVEST subsidy program by the Federal Ministry of Economic Affairs and Energy for angel investors is promoted, offering a 20% tax free reimbursement for angel investments done over EUR 10,000. Lastly the Hamburg based accelerator and incubator programs mentioned in chapter 3.2 are linked as well.

Co-working and real estate: In addition to introducing the various co-working spaces throughout the city that were mentioned in chapter 3.2, this segment specifically advertises real estate databases by Hamburg Kreativ Gesellschaft, Landesbetrieb Immobilienmanagement und Grundvermögen (LIB Hamburg (public real estate management company of the City of Hamburg) and additionally subsidised commercial real estate operated by steg Stadterneuerungs- und

³⁴ Bundesverband Deutscher Kapitalbeteiligungsgesellschaften e.V. (BVK), 2016. Suche nach Beteiligungskapital. *kvkap.de*. Available at: <http://www.bvkap.de/beteiligungskapital/kapitalsuche> [Accessed November 16, 2016]

³⁵ NOAH Conference, 2015. NOAH15 Berlin Fund Book. *relayto.com/noah-conference*. Available at: <https://relayto.com/noah-conference/nK4mnpEp> [Accessed November 16, 2016]

³⁶ Business Angels Netzwerk Deutschland e.V., 2016. Business Angels Netzwerk Deutschland. *business-angels.de*. Available at: <http://www.business-angels.de> [Accessed November 22, 2016]

Stadtentwicklungsgesellschaft Hamburg mbH, a publicly owned company working on urban development projects for the City of Hamburg.

Business operations: This segment provides information about consulting and coaching services offered by local advocacy groups in regards to pr, marketing and sales. In addition links to best practices and guidelines surrounding topics such as search engine optimisation (SEO), social media, online marketing, pr and customer relationship management (CRM) are integrated.

Employees/Recruiting: Tools and tips on recruiting, management, rights and responsibilities, employment law and subsidies are provided in this section. Special topics such as part time and temporary employment, equal rights, employee involvement, immigration law are summarised and linked to corresponding entities in local or federal government. Information on where and how to look for potential talents or current jobs offered are not integrated.

Additional contacts: This segment lists various entities in the entrepreneurial ecosystem, most of which were already mentioned in previous sections. In addition entities such as Hamburg Chamber of Commerce, Hamburg Kreativ Gesellschaft, hei, Hamburger Existenzgründungsinitiative and Hamburgische Investitions- und Förderbank (IFB) and the various services provided by local universities are listed here. This is the only place where universities are mentioned within the Starter Kit with only very basic information provided.

Still the nextMedia.Hamburg website names local universities as important players for relevant education in regards to media industry related jobs. In addition to universities named in chapter 3.2, private institutions such as Miami Ad School, Texternschmiede and Technische Kunstschule Hamburg are referenced along with remarks on various media corporations offering industry training, internships and general employment opportunities. Latter are mentioned without providing any links or means to find additional information.

To sum up, in the category of Service & Support, the nextMedia.Hamburg initiative provides information on the local media/IT economy and surrounding conditions for new business formation and offers ways to get in touch with relevant stakeholders within public entities to advise in regards to business formation, financing and operations.

Activity Field: Publishing

The nextMedia.Hamburg initiative produces various publications in addition to the information provided and illustrated above. In addition to a news blog, reporting on both nextMedia.Hamburg activities as well as developments within the entrepreneurial ecosystems, there is a collection of PDF brochures and flyers about the local startup economy, the games sector in Hamburg as well as reports on events and industry trends.

A micro site about the startup hotspot Hamburg is linked. It contains information also available on the initiative's website and additionally embeds videos with interviews of prominent entrepreneurs and upcoming founders from Hamburg. It utilises technology provided by pageflow, a tool for interactive multimedia storytelling developed by German startup Codevise Solutions in collaboration with WDR.

The nextMedia.Hamburg initiative also publishes a digital magazine, called UNIFIED. It is available through pageflow as well and reports on topics such as media innovation, digital culture, monetisation, virtual reality and knowledge collaboration. So far, 10 issues have been published (as of November 2016).

With the nextMedia.Compass the initiative publishes cases of the day, providing daily access to content and technology trends. Every case is available as a 1-page PDF and briefly introduces the topic with links to further information.

To sum up, the nextMedia.Hamburg initiative provides the creative and digital community with various information in different news formats. Ranging from daily blog posts to digital magazines and long form publications, in-depth insights into specific media industry topics are provided.

Activity Field: Networking

Several networks and advocacy groups are linked on the nextMedia.Hamburg website, among them are Hamburg@Work (e.V.), Filmförderung Schleswig-Holstein GmbH, hamburgunddesign, Kreativgesellschaft Hamburg, Interessengemeinschaft Hamburger Musikwirtschaft (IHM), Hamburg Startups and #DMV Digital Media Women among many others. Hamburg@Work (e.V.) is featured prominently since it is one of nextMedia.Hamburg initiators along with the City of Hamburg. A paid

membership at different tiers in its association is promoted, which provides additional information with newsletters, closed event invitations and membership conditions for specific services not specified. Another entity and corresponding membership promoted specifically is the Gamecity:Hamburg network, offering specific event invitations as well.

Networking is also attributed to various events within the metropolitan area. Information about relevant events are integrated into an event calendar prominently featured throughout the website. Some of the events are organised by nextMedia.Hamburg itself while others are sponsored or supported by the initiative.

Events organised by nextMedia.Hamburg:

In addition to events introduced in chapter 3.2, namely NewTV Kongress, Scoopcamp and Webfuture Awards, the nextMedia.Hamburg initiative organises several additional event formats:

NewTV Foren: With topics ranging from production processes to distribution channels, dedicated workshops relevant to the TV industry are offered. The events are organised by nextMedia.Hamburg in collaboration with industry professionals from Hamburg based media companies

Gamecity Treff: 4 events are organised per year, connecting industry professionals within the game industry with talks on current issues, panel discussions and networking opportunities. Once a year an additional Gamecity Night attracts international attention

nextMedia.in/Sight: Advertised as an exclusive top level executive event, this format caters to managers within the publishing, advertising, design, music and technology industry. Current issues within the content and technology sphere are discussed from a business perspective and international industry players present strategies, products and ideas for the digital transformation.

nextMedia.Lectures: Advertised as an event format for operational managers within the media and digital economy, various lectures provide insights by industry experts and networking opportunities. Topics range from content strategies to virtual reality and chat bots.

Events in cooperation with nextMedia.Hamburg:

Several events offered in Hamburg are organised in cooperation or are in some way supported by nextMedia.Hamburg. Apart from events already introduced in chapter 3.2 - namely Hamburger IT Strategietage, ADC Festival, Next Conference, Social Media Week, Online Marketing Rockstars, Solutions.Hamburg and 12min.me - following events are mentioned on the website:

Mediendialog Hamburg: Once a year, executives from all media and communication industries discuss the digital transformation and media policy agendas. The City of Hamburg offers a intersectional forum for discussion and networking and facilitates agreements on common goals and strategies

TEDx Hamburg: The annual innovation conference organised independently from the official TED format discusses ideas for change and improvement in mobility, art, culture, health, education and urban space among many other topics. TED stands for technology, entertainment and design and combines talks and performances in an unique conference format.

Online-Karrieretag Hamburg: The annual career event is the largest within the digital industries and allows interested professionals to get in touch with media corporations such as Google, Gruner + Jahr and XING. nextMedia.Hamburg is offering 3 slots for local startups to exhibit as a employer during the event. Applying startups will be selected based on their pitchdeck.

Hamburg Games Conference: The annual games conference is organised in conjunction with Gamecity:Treff by the media law firm GRAEF and is supported by gamecity:Hamburg. The main focus of the event are potentials for cooperations with other media and entertainment industries.

VOCER Innovation Day: VOCER Innovation Medialab and DER SPIEGEL are discussing issues related to journalism and digital business models with interested media professionals.

MLOVE Forum: During the event for CIOs of established businesses in the digital industry, 5 slots for Hamburg based startups are offered through the next.Media.StartHub. Selected startups can pitch their business ideas to potential investors during the event and may receive coaching sessions with selected mentors.

Neumacher Konferenz: The event is organised by WirtschaftsWoche magazine and offers a founders award to applying startups during the annual conference.

Digital Bootcamp: Organised by mediapreneure GmbH, a 3-day workshop to educate journalists on digital business models and ways to monetise content is offered.

(SXSW): Although not a Hamburg based event, it is still worth mentioning that nextMedia.Hamburg is supporting local startups applying to the SXSW accelerator and industry professionals hosting panels. The annual South by Southwest Festival (SXSW) is one of the most important events for creative industries worldwide.

To sum up, the nextMedia.Hamburg initiative quite actively pursues the development of event formats both by organising and supporting events catering to a wide variety of people on all hierarchies in the media industry or related businesses. Startups are an integrate part of many events, underlining their innovative potential in the eyes of the event organisers and certainly on the eyes of nextMedia.Hamburg initiative.

The nextMedia.Hamburg initiative is a central hub for information and networking within the media/IT industry with a strong focus on the publishing and games industry as well as the startup economy. Entrepreneurial activities related to the media industry are of particular importance to the initiative as is evident in all parts of its publications. The IT sector itself is not mentioned specifically but could be understood as the underlying backbone of the industry cluster as well as the driving force behind the innovation and disruption potential attributed to startups.

4.2 Regional programs

As follows, the regional programs to support entrepreneurial activities initiated or encouraged by the City of Hamburg are outlined. Not all are aimed at startups specifically and can theoretically be called upon by anyone qualifying.

Innovationsstarter Fonds Hamburg: Initiated and operated by the Hamburgische Investitions- und Förderbank (IFB), the Innovationsstarter Fonds Hamburg offers investment opportunities for young, innovative businesses, meant to facilitate research and development capabilities. Applying businesses need to be located in Hamburg, may not be older than 6 years, need to be small or medium-sized

enterprises (SMEs) with a maximum of 50 employees and may not have revenues exceeding EUR 10 million per year. Usual investments can be as high as EUR 500,000 for 15% equity per round of funding. The total investment is limited at EUR 1 million and requires the founder's equity to be at least 15% in addition to secondary investors. The program specifically states significant growth potential and technology-driven USPs with a timeframe of 3-8 years until an exit as requirements for investment. Among the companies funded by the Innovationsstarter Fonds Hamburg are connected health, Familonet and joints. Prominent startup Tinnitracks (treating tinnitus with adjusted music files), which achieved a substantial seven-figure series A round in 2015 after winning the accelerator pitch at esteemed SXSW conference (Austin, Texas), is also backed by the program³⁷. The program is partly funded with subsidies from the EU (EFRE). Online: innovationsstarter.com

InnoRampUp: The special program created by the Hamburgische Investitions- und Förderbank (IFB) provides grants for innovative new firms and existing young companies. Applying businesses must be based in Hamburg, may not be older than 2 years and must have a business idea qualifying as "above average innovative". The program offers up to EUR 150,000 of funding, all of which can be subsidised as a grant. Among startups funded by InnoRampUp are audioguideme, bentekk, eBlocker and trip rebel. Prominent social reading startup sobooks (created by Sascha Lobo), which is offering its ebooks in Lufthansa's inflight entertainment systems through a cooperation with Lufthansa Innovation Hub³⁸, is also funded by InnoRampUp. The program is partly funded with subsidies from the EU (EFRE). Online: innovationsstarter.com/innorampup/

Hamburg-Loan Innovation: The Hamburgische Investitions- und Förderbank (IFB) provides low-interest loans for financing equipment and investments with sums between EUR 100,000 and EUR 1.5 million for young innovative startups and small and medium-sized enterprises (SMEs). Up to 100% of the funds can be subsidised as a grant or otherwise have a retention of up to 10 years. Technology-driven products and business models at the gateway between content and technology are

³⁷ Skrabania, L., 2015. Siebenstelliger Betrag für E-Health-Lösung Tinnitracks. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/allgemein/tinnitracks-sonormed-finanzierung> [Accessed November 22, 2016]

³⁸ Dahlmann, D., 2016. Was macht eigentlich der Lufthansa Innovation Hub. *gruenderszene.de*. Available at: <http://www.gruenderszene.de/automotive-mobility/lufthansa-innovation-hub> [Accessed November 22, 2016]

mentioned specifically as a requirement to participate in the program³⁹. Online: ifbhh.de/hamburg-kredit-innovation

Additionally services offered by Bürgschaftsgemeinschaft Hamburg (loan guarantee association) and hei. Hamburger Existenzgründungsinitiative outlined in chapter 3.2 can be considered related to the public policy agenda as well. Although privately organised they are both encouraged and featured by the nextMedia.Hamburg initiative and other entities within the local government.

Other industry clusters outlined in chapter 4 might have specific programs to aid entrepreneurial activity as well. Since the City of Hamburg is focussing its efforts to support the formation of high-growth ventures on the media/IT cluster, further exploration of other initiatives exceeds the scope of research in this thesis.

4.3 Federal programs

As illustrated in chapter 3.2 there are several loan and subsidy programs available on a federal or even international level. The most important ones are introduced in greater detail below.

Gründungszuschuss: Available through the Bundesagentur für Arbeit (Germany's Federal Employment Agency), everyone unemployed or threatened with pending unemployment can apply for subsidies when starting a business or self employment. The Gründungszuschuss (often called Existenzgründerzuschuss) is meant to cover living expenses and social security costs for a limited period of time after starting the entrepreneurial activity⁴⁰. It is granted on a case by case basis (meaning there is no guarantee to receive the subsidy) and requires a remaining entitlement to employment benefits for at least 150 days and a minimum of 15 hours per week commitment to the entrepreneurial activity. Additionally applicants must provide verification of relevant skills and know-how as well as a business plan approved by an expert authority. The program is offered in two phases. For a period of six month

³⁹ Hamburgische Investitions- und Förderbank, 2016. Förderung für mehr Innovation in Hamburg. *ifbhh.de*. Available at: <https://www.ifbhh.de/hamburg-kredit-innovation/> [Accessed November 22, 2016]

⁴⁰ Bundesagentur für Arbeit, 2014. Finanzielle Hilfen für Existenzgründerinnen und Existenzgründer. *arbeitsagentur.de*. Available at: <https://www.arbeitsagentur.de/web/content/DE/BuergerinnenUndBuerger/ArbeitundBeruf/Existenzgruendung/FinanzielleHilfen/index.htm> [Accessed November 22, 2016]

the monthly amount of unemployment pay is granted with an additional EUR 300 for social security. For an additional nine months EUR 300 for social security can be granted if intensive entrepreneurial activities can be demonstrated. A renewed funding is only possible if 2 years have passed after starting the last entrepreneurial activity that was funded by the Bundesagentur für Arbeit. The program has no other requirements and has no limits in terms of scope of the business. Online: www.arbeitsagentur.de/web/content/DE/BuergerinnenUndBuerger/ArbeitundBeruf/Existenzgruendung/Index.htm

EXIST Scholarship: Initiated by Germany's Federal Ministry for Economic Affairs and Energy, the EXIST scholarship is a national support program aimed to foster entrepreneurial activities in Germany by increasing the number and prosperity of knowledge and technology based startups. The EXIST program is co-financed by the European Social Fund (ESF) and offered three schemes aimed at entrepreneurial activities linked to research universities.

The "EXIST Culture of Entrepreneurship" scheme attempts to support universities in their efforts to increase entrepreneurial culture. Between 1998 and 2012 total subsidies of approximately EUR 104 million supported 72 projects, offering various training and networking services to students as well as implementing entrepreneurship programs into university curriculums⁴¹ and granting EXIST Entrepreneur University Awards.

The "EXIST Transfer of Research" scheme funds research and development efforts to prove technical feasibility for innovative startup ideas. Funds are available in two phases, the first to develop results of research into a basis of a business idea, the second to advance further resource development and to prepare for the start of actual business operations and external financing. Phase one is eligible for subsidies up to EUR 250,000 for personnel expenses, material and equipment for a period of generally 18 months (up to 36 months if necessary) for up to 100% of the project costs. Phase two requires actual business formation and EUR 25,000 raised during phase one and is eligible for subsidies up to EUR 180,000 for a period of up to 18 months and up to 75% of the project costs. Phase two also requires equity capital in the ratio of 1:3 up to EUR 60,000⁴².

⁴¹ Federal Ministry of Economic Affairs and Energy, 2016. EXIST Culture of Entrepreneurship. *exist.de*. Available at: <http://www.exist.de/EN/Programme/EXIST-Culture-of-Entrepreneurship/content.html> [Accessed November 15, 2016]

⁴² Federal Ministry of Economic Affairs and Energy, 2016. EXIST Transfer of Research. *exist.de*. Available at: <http://www.exist.de/EN/Programme/EXIST-Transfer-of-Research/content.html> [Accessed November 15, 2016]

By supporting students, university graduates and scientists at public and non-profit universities with the “EXIST Business Start-up Grant” scheme, the subsidy program attempts to promote entrepreneurial culture. Subsidies are limited to innovative technology or innovative knowledge based services and grant personal living expenses with EUR 3,000/month for entrepreneurs with a doctorate, EUR 2,500/month for university graduates and EUR 1,000/month for students. Materials and equipment are funded up to EUR 10,000 for solo startups and up to EUR 30,000 for teams. In addition EUR 5,000 worth of coaching is provided. The program is limited to 12 months and needs to be applied for in conjunction with a university involved in an Entrepreneurial Network⁴³. Online: exist.de

High-Tech Gründerfonds (HTGF): Claiming to be Germany’s most active and leading seed stage investor, the High-Tech Gründerfonds (HTGF) invests venture capital in technology-driven businesses. The investor provides investments up to EUR 600,000 at the seed stage for 15% of equity with an additional EUR 1.4 million being available for follow-up financing if criteria are met. The funded business must be located in Germany, less than 1 year old, add 10% of the investment by the entrepreneurs or through side investors and must be a SME with a maximum of 50 employees and a revenues below EUR 10 million. The investment by the HTGF is meant for the development of product prototypes or proof of concepts. Additionally investment management services are provided to secure additional means of financing. Some of the most prominent startups funded by the High-Tech Gründerfonds (HTGF) are 6 Wunderkinder, AdTriba, bab.la, plista, textunes and windeln.de. As of November 2016, 451 investments since 2005 are listed on the website with EUR 576 million worth of funding by the HTGF, more than EUR 1 billion of additional financing and 64 exits⁴⁴. Online: high-tech-gruenderfonds.de

Horizon 2020: The European Commission’s Horizon 2020 program claims to be the biggest EU Research and Innovation program with almost EUR 80 billion worth of funding available between 2012 and 2020. It aims at innovative small and medium sized enterprises (SMEs) for financial investment of up to EUR 2.5 million in addition to business coaching services. Proposals can be submitted by anyone within the EU and are evaluated and selected to be developed into full proposals and subsequently projects if selected for funding. The ambitious program aims at

⁴³ Federal Ministry of Economic Affairs and Energy, 2016. EXIST Business Start-up Grant. *exist.de*. Available at: <http://www.exist.de/EN/Programme/EXIST-Business-Startup-Grant/content.html> [Accessed November 15, 2016]

⁴⁴ High-Tech Gründerfonds, 2016. Facts & Figures. *high-tech-gruenderfonds.de*. Available at: <http://high-tech-gruenderfonds.de/en/#facts-figures-2> [Accessed November 16, 2016]

securing Europe's global competitiveness and states that research is an investment for sustainable growth and job creation. As of April 2015, 3,246 grant agreements have been signed and provided EUR 5.5 billion of funding⁴⁵. Still the program might be limited to ambitious entrepreneurs, since some of the largest projects, such as EUROfusion (realisation of fusion energy, total cost around EUR 857 million), H2ME (Hydrogen Mobility Europe, total costs around EUR 68 million) or SmartEnCity (development of highly adaptable and replicable systemic approach towards urban transformation into sustainable, smart and resource-efficient urban environments, total cost around EUR 32 million) seem out of reach for most young businesses⁴⁶. Online: ec.europa.eu/programmes/horizon2020

As outlined throughout this chapter, there are various programs and activities available for entrepreneurs that are closely linked to public policy agendas towards entrepreneurship. In addition to financial aid, free information and support provided, public initiatives such as nextMedia.Hamburg function as a gateway to both industry and entrepreneurial ecosystem stakeholders and facilitate the networking activities between them.

As dynamic and versatile as these efforts might seem, it seems prudent to cross check the outlined activities and programs with recent scientific research findings and to discuss resulting implications.

⁴⁵ The European Commission, 2016. Horizon 2020 statistics. *europa.eu*. Available at: <https://ec.europa.eu/programmes/horizon2020/en/horizon-2020-statistics> [Accessed November 16, 2016]

⁴⁶ The European Commission, 2016. CORDIS - EU research projects under Horizon 2020 (2014-2020). *europa.eu*. Available at: <https://data.europa.eu/euodp/en/data/dataset/cordisH2020projects> [Accessed November 16, 2016]

5 Discussion

Quite obviously it is the purpose of any public policy agenda towards entrepreneurship to foster new business formation and prosperous development of new enterprises. As is evident in many locations around the world and also in Hamburg, the innovation potential attributed to startups with high-growth potential is the main motivator for shaping public policy to nurture these ventures specifically. It is common believe that startups, more specifically high-growth ventures, not only have the capacity to transform and reshape industries such as within the media/IT cluster in Hamburg, but also entail the potential to generate economic growth and subsequently create jobs.

Taking into consideration various research findings over the past years, it seems that this link is highly disputed among scientists. This calls for a more detailed analysis of the outlined strategies for the entrepreneurial ecosystem in Hamburg in respect to arguments presented by Shane (2009), Morris et al. (2015), Audio et al. (2007), Autio and Ranniko (2015), Brown & Mawson (2015), Moutinho et al. (2015) and Ranga & Etzkowitz (2016).

5.1 Public Policy orientation

As outlined in chapter 2.3 it is evident that high-growth entrepreneurship effects innovative change and economic growth, while regular forms of entrepreneurship do not (Autio 2005b, Henrekson and Johansson 2008, Stam et al. 2009). Subsequently, in order to achieve the goal of generating economic growth, public policy has to address entrepreneurial firm growth specifically.

The City of Hamburg and the nextMedia.Hamburg initiative stress the necessity for innovation in the outlined strategy documents and activities. Technology-driven startups are attributed with having the innovative potential to disrupt and reshape entire industries, therefore being an integral part of the city's strategy to manage the ongoing digital transformation within the media/IT cluster in Hamburg. The nextMedia.Hamburg initiative provides information and support and facilitates networking for aspiring entrepreneurs, while entities like Hamburg Chamber of Commerce assist and consult interested parties on firm formation and financing options. The Hamburgische Investitions- und Förderbank (IFB) provides specific loan and subsidy programs for innovative new businesses and other publicly supported and privately managed entities provide coaching and financial aid as well.

The requirements to access some of the regional programs clearly state characteristics necessary to achieve economic growth. The Innovationsstarter Fonds for instance requires significant growth potential as a requirement for investment and InnoRampUp requires a business idea to be “above average innovative”. Federal programs such as the EXIST Scholarship and High-Tech Gründerfonds (HTGF) also name innovative potential as a requirement.

These measures seem to be in line with a “picking winners” strategy and are consistent with issues discussed by Shane (2009). Since most startups are no source for economic growth or job creation, general encouragement of entrepreneurship is deemed flawed in his research and a focus on supporting high-growth ventures only is recommended. However, it remains unclear whether policy makers in Hamburg are aware of this, since overall it seems that increasing the number of startups in general is a goal pursued despite the subsidy programs mentioned being targeted at firms with high-growth potential.

The approach proposed by Shane also misses the issue that even a high-growth venture still requires someone to start it in the first place - at some point where a venture would not qualify as a high-growth firm and therefore not be supported.

Morris et al. (2015) point out risks for longterm economic development if formation of non high-growth ventures is not encouraged by policy agendas as well. They call for a portfolio approach to entrepreneurship policy, differentiating different kinds of ventures, their roles within the economy and their different requirements in terms of support, to ensure a healthy economic development. It is concluded that adaptive policies are required to manage the dynamics within entrepreneurial ecosystems to ensure economic growth.

There are many measures in Hamburg that do not require a specific high-growth approach, such as the BG-Bürgschaft loan guarantee on a regional level and Gründungszuschuss on a federal level. Additionally loan programs offered by the KfW are targeted at startups and young businesses, but do not necessarily require the company to have high-growth potential, calling into question the entailed definition of a startup. Also many types of consulting and support services offered are not limited to innovative ventures but are open to anyone interested.

Unfortunately it does seem like this is a purposely pursued course by policy makers on a regional or federal level but rather a structure of programs having evolved over many years or even decades, still addressing needs articulated at the time of their

inception with questionable application for entrepreneurs today. Although being aimed at various target audiences, the programs do not seem to cater to fundamentally different types of businesses nor do they seem to be adaptive to changing conditions and requirements.

Also the approach by Morris et al. (2015) calls for consideration of high-growth venture specific requirements in categories such as liberal bankruptcy laws, intellectual property protection, tax write-offs, R&D partnerships, programs to build high-growth management capacity and many others. Potential agendas pursued by the City of Hamburg in this regard remain hidden from the reviewed documents. Only current conditions of laws, tax regulation and partnership opportunities are outlined without discussing any need for change in that respect. This calls into question the long term perspective for the surrounding conditions for high-growth entrepreneurs in the entrepreneurial ecosystem in Hamburg.

Another issue is the focus on the media/IT cluster for the public policy agenda outlined by the City of Hamburg. Especially through its nextMedia.Hamburg initiative it strongly accentuates the technology-driven media industry. Auto et al. (2007) stipulate that rapid growth is expected to occur in technology-push situations and that technology is deemed key for economic success by many policy makers. However, after analysing small and medium-sized enterprise (SME) support initiatives in nine countries, they conclude that investment in technology production and commercialisation does not guarantee success. Additionally Brown & Mawson (2015) confirm that high-growth ventures are in fact not disproportionately high-tech firms, deeming public policy to support these ventures specifically as ineffective. They recommend a focus on a versatile pool of startups from which high-growth potential startups can emerge.

The policy focus on technology-driven startups within the media/IT cluster in Hamburg may therefore not only be ill advised but also contradictory to the overall objective of generating economic growth and creating jobs, since it might inadvertently exclude companies with vast potential outside of the policy scope.

Considering the largest corporations in Hamburg and the industries they are in (see table 19), it might be self evident that there is potential for innovation in the corresponding industry clusters and therefore potential for a higher impact on economic development if addressed accordingly.

5.2 Frameworks to categorise public efforts

In order to better understand the different programs and service offered, it seems prudent to categorise and classify the public efforts to foster entrepreneurship in Hamburg. Autio & Ranniko (2016) distinguish between buffering, bringing and capacity-boosting approaches within entrepreneurship policy. Buffering activities are meant to provide means to protect firms from resource shortness and dependencies as well as non-monetary benefits such as training, consulting, low cost office space, tax benefits and other privileges. They are aimed at all kinds of entrepreneurship and can be accessed by anyone who applies. Bridging activities are targeted selectively at high-growth ventures using a competitive process. They connect firms with business angels, venture capitalists and other stakeholders through means like networking. Lastly, capacity-boosting activities are meant to nurture the innovative capabilities of entrepreneurs. They are available for anyone who applies and do not have a focus on financial components.

Strategic Cornerstone	Operational Measures	Buffering Policy	Bridging Policy	Capacity-Boosting Policy
Innovation Climate	<ul style="list-style-type: none"> - Innovation Portal - Marketing Hamburg as Innovation Location - Central Research-Information-System 			x
Education	<ul style="list-style-type: none"> - Advanced learning laboratories - Transparency about setup of advanced learning opportunities - Enhance permeability in education areas - Intensification of marketing efforts 			x
Transfer	<ul style="list-style-type: none"> - Innovation Contact Point (IKS) - Research meets industry - Specific network initiatives 		x	
Subsidies	<ul style="list-style-type: none"> - Investment funds - Entrepreneurship aid program InnoRampUp - Establishment of innovation agency within IFB - Standard subsidy directives for innovation in Hamburg - Hamburg consulting standards 	x	(x)	

Table 20: Classifying measures outlined in Hamburg’s regional innovation strategy 2020 in terms of Autio & Ranniko (2016)

Strategic Cornerstone	Operational Measures	Buffering Policy	Bridging Policy	Capacity-Boosting Policy
Infrastructure	<ul style="list-style-type: none"> - Research & Innovation Parks - Establishment of a Fraunhofer Institute - Extension of practise oriented R&D 			x

The operational measures outlined in the “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 (Untiedt 2014) can be classified in terms of Audio & Ranniko (2016). Most of the activities and programs focus on capacity-boosting for potential entrepreneurs. High-Growth venture specific activities can be found in certain network activities, such as “Research meets industry” or subsidy programs, such as “Entrepreneurship aid program InnoRampUp”, and therefore qualify as bridging policy. Still the majority of the subsidies measures outlines rather qualify as buffering policies (see table 20).

Since nextMedia.Hamburg qualifies as a network initiative within the scope of the innovation strategy and specifically targets potential high-growth ventures, the entrepreneurial support activities and services offered can be categorised in more detail. Autio et al. (2007) provide categories for examination and assign these to traditional policy domains such as innovation policy, business/industrial policy and financial market policy, arguing that typical policy silo limitations need to be crossed for entrepreneurship policy to be effective (see fig. 7).

The most important programs and services available to entrepreneurs in Hamburg that are supported by public entities can be categorised in terms of Audio et al. (2007) as follows. Interestingly, although an abundance of support measures is available, some important topics are missing from the analysed documents (see table 21).

For instance there are no detailed information about R&D tax cuts and means for internationalisation financing to be found in the discussed documents and activities in Hamburg. Although various measures are to be found within the development orientation of innovation policy, still it remains questionable if these measures fulfil requirements of aspiring high-growth ventures in terms of subsidies. There are ample opportunities provided within the business creation and business development orientation of the business/industrial policy domain. It seems that local

universities are expanding their efforts in the entrepreneurial sphere, so training opportunities will increase over time. The one-stop information shop approach taken by nextMedia.Hamburg is implemented consequently. In regards to the finance policy domain, limited access to angel and venture capital must be attested. Mainly done through networking events, this area lacks structure to nurture the development of local investment activities. Also, only very limited information about venture capital tax subsidies are to be found and the position of the City of Hamburg in regards to potentially changing legislation in this regards remains unclear.

Table 21: Categorisation of programs and services available to entrepreneurs in Hamburg in terms of Autio et al. (2007)

Policy Domain	Thematic Category	Support Measure	Orientation
Innovation	Research commercialisation centers	- Hamburg Innovation (HI) - TuTech Innovation (TUTECH)	Research
Innovation	Research commercialisation grants	- (Innovationsstarter Fonds Hamburg)	Research
Innovation	R&D tax cuts	-	Development
Innovation	Technological development subsidies (equipment & IP)	- Innovationsstarter Fonds Hamburg	Development
Innovation	Commercialisation subsidies	- InnoRampUp	Development
Innovation	Incubation and technology parks	- low cost offices (KAROSTAR, gamecity:Port, etc.) - InnovationsCampus Green Technologies (ICGT) - Creative Space for Technical Innovation (CSTI) - Startup Dock (TUHH) - Media Campus Finkenau	Development
Business/Industrial	Business idea competition	- Hamburg Innovation Summit - Hamburg IT Tage (Startup Call) - Reeperbahn Festival - Webfuture Awards - Music WorX Accelerator - MLOVE Forum - Neumacher Konferenz - (SXSW) - (betahaus)	Business creation
Business/Industrial	Entrepreneur spawning	- Gründungszuschuss - EXIST Scholarship - Startup Dock (TUHH) - local university programs	Business creation
Business/Industrial	Business coaching	- Gründungszuschuss - EXIST Scholarship - hei. Hamburger Existenzgründungsinitiative - Hamburg Kreatik Gesellschaft - Hamburg@Work - nextMedia.Hamburg - Hamburg Chamber of Commerce	Business Development

Policy Domain	Thematic Category	Support Measure	Orientation
Business/ Industrial	Consulting subsidies	- hei. Hamburger Existenzgründungsinitiative - Hamburg Chamber of Commerce	Business Development
Business/ Industrial	Entrepreneur training	- hei. Hamburger Existenzgründungsinitiative - nextMedia.Hamburg - Hamburg Chamber of Commerce - Startup Dock (TUHH) - local universities - (betahaus)	Business Development
Business/ Industrial	One-stop information shop	- nextMedia.Starhub - Hamburg Chamber of Commerce - Hamburgische Investitions- und Förderbank (IFB)	Business Development
Finance	BA and VC access	- nextMedia.Hamburg - Hamburg Chamber of Commerce - (networking events)	Seed, startup and growth financing
Finance	Loan subsidies	- Hamburg-Loan Innovation - BG-Bürgschaft - KfW	Seed, startup and growth financing
Finance	Venture capital (tax) subsidies	- INVEST tax reimbursement for angel investors	Seed, startup and growth financing
Finance	Venture capital funds	- Innovationsstarter Fonds Hamburg - High-Tech Gründerfonds (HTGF) - Horizon 2020	Seed, startup and growth financing
Finance	Internationalisation financing	-	Seed, startup and growth financing

Although the public policy approach towards entrepreneurship in Hamburg seems to be largely managed through the nextMedia.Hamburg initiative, evidently various other agencies and policy departments in Hamburg are involved. This might be due to the fact, that the Senatskanzlei Hamburg (senat office) has created an Amt für Medien (media department), integrating the responsibility for the media/IT industry cluster at the highest level of regional administration (Senatskanzlei Hamburg 2011).

This commendable approach, although undoubtedly very complicated, seems to be in line with findings by Audio et al. (2007) at first glance, emphasising the need for new focus and sophistication to be introduced in policy-making to nurture entrepreneurial potential and cross traditional limitations of policy silos. Concrete implementations of strategic measures in Hamburg unfortunately lack transparency to comprehensively assess the efficiency of the city's innovation policy in this regard.

5.3 Regional Innovation Systems and the Triple Helix Approach

Throughout the “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 (Untiedt 2014) there is strong emphasis on education as well as research and development (R&D) efforts with the specific objective to nurture commercialisation of research findings in order to position the City of Hamburg as an innovation location in Europe. Although the background data and underlying motivations behind this aspirations can not be found in official documents, this is in line with findings by Moutinho et al. (2015) who analyse the role of Regional Innovation Systems (RIS) for evidence of economic and employment growth through research & development. Factors such as knowledge spillovers, technological transference and new business formation might very well contribute to these objectives and could be attributed to some degree to the actors in the entrepreneurial ecosystem in Hamburg and the measures by public entities outlined above. Still Moutinho et al. (2015) conclude that Regional Innovation Systems (RIS) might have severe side-effects if not managed in an integrated way, increased unemployment and slowed economic growth among others. University R&D investments are found to have the potential to reduce unemployment, especially youth-unemployment, while government R&D investments have only small effect on economic growth and no significant impact on employment whatsoever.

Subsequently this calls for more investments in university research & development programs and potentially a shift away from traditional subsidies and incentives to use public funds more effectively. Since many subsidy programs are not managed regionally but on a federal level, they require new legislation to change them. Although evident that some of the federal programs have limited effect on entrepreneurial growth, the position of the City of Hamburg towards these issues remains unclear. On a regional level however, the City of Hamburg seems to accentuate university research & development investment as is outlined in the innovation strategy document introduced above.

The Triple Helix approach, developed by Etzkowitz in the 1990ies, explores the shift from a predominant setup of industry-government dyad to triadic dependencies between university, industry and government. It positions the university as a leading entity within the construct of relationships with industry and government on a regional level to generate knowledge spillover and therefore innovation and economic development. Recent shifts in university's objective to increasingly

commercialise research findings and their ability to provide young people with ideas, skills and entrepreneurial talent as well as the capacity to create new technologies are considered the most important reasons behind the new prominent role of universities in this regard (Ranga & Etzkowitz 2016).

Over the past decades, triple helix configurations evolved from a “statist” model, where government is the driving force and capacities for innovation are limited, to a “laissez-faire” model, where industry is the driving force with universities providing human capital and having limited roles in innovation, to an emerging “balanced” model, where universities take the leading role in facilitating innovation in joint partnership with industry and government, seemingly offering the best environment for innovation at the intersection of the 3 stakeholders (see fig. 19).

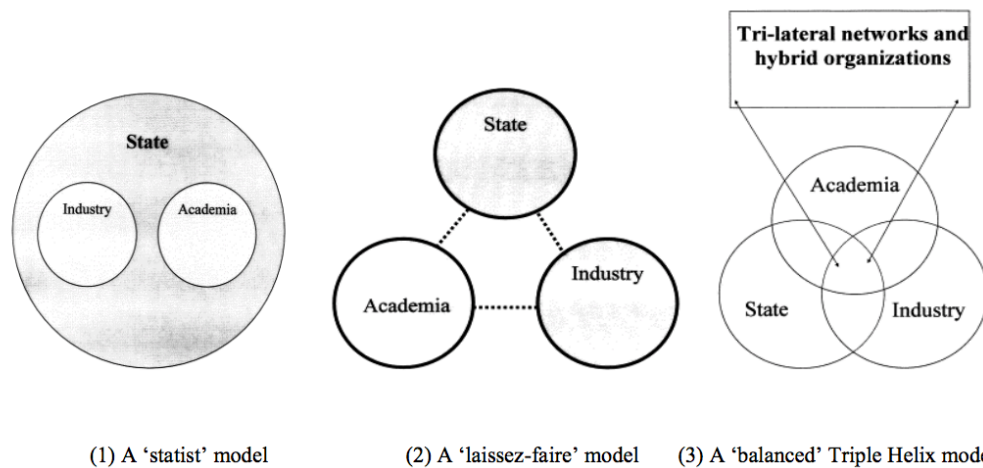


Figure 19: Triple Helix configurations by Etzkowitz and Leydesdorff (2000)

Acknowledging the fact that research & development (R&D) is not the only ingredient to innovation, the triple helix approach integrates the components university, industry and government with their interdependent relationships and functions and considers activities and factors such as technology adoption, organisational capacities, the role of individual innovators and entrepreneurs as well as means for networking, collaboration, conflict management and collaborative leadership (Ranga & Etzkowitz 2016). Subsequently “multi-sphere” (hybrid) institutes at the intersection of university, industry and government such as technology transfer offices, industry and university research labs, science parks and technology incubators and many others fulfil the necessary function to facilitate innovation towards economic growth.

Cooperation between university, industry and government also play a central role in innovation polices implemented by the European Union (EU), such as the

Innovation Union initiative outlined in the Europe 2020 strategy (European Commission 2011).

A triple helix approach is mentioned specifically as the underlying principle behind the Hamburg Innovation Summit (#HHIS) event, connecting local stakeholders in government, industry and university. Research related entrepreneurship is supported with various programs and several Hamburg based universities cater to both industry and aspiring entrepreneurs with research commercialisation opportunities. The importance of collaboration between industry and university is also addressed in the “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 (Untiedt 2014), mentioning specific operational measure in the transfer and infrastructure segments of the strategy, such as creating research & innovation parks, extending practise oriented R&D and increasing networks between research an industry stakeholders.

Within the nextMedia.Hamburg initiative, the triple helix approach is not that evident. On the website and in linked documents, local universities and research institutions are mentioned with basic information only, downplaying the importance for talent and innovation. This is curious since some of the universities are in fact listed as key partners of the initiative, such as Hamburg University of Technology and Hamburg University of Applied Sciences. Although these universities offer specific study programs relevant to nurturing the entrepreneurial ecosystem and resident professors function as advisors to the initiative, regional higher education institutions play a minor role apart from being a provider of skilled human capital.

To sum up, Hamburg policies towards entrepreneurship are in line with some very general research findings, although this seems to be rather coincidental than purposely planned. Many measures discussed lack the proper focus and orientation to be deemed considerate of issues raised by researchers Shane (2009), Morris et al. (2015), Audio et al. (2007), Autio & Ranniko (2016) and Brown & Mawson (2015). Although these researchers take opposing positions in many respects, a focus on one position or the other can not be found in the strategy document and measures analysed.

Still the City of Hamburg seems to actively pursue valid strategies in regards to Regional Innovation Systems (RIS) and is apparently aware of issues raised by Moutinho et al. (2015). In terms of a triple helix approach, Hamburg shows many promising measures and activities for a “balanced” triple model helix model as outlined by (Ranga & Etzkowitz 2016) with still ample room for future improvement.

6 Metrics to track impact

In order to effectively manage public policy agendas towards entrepreneurship and to measure development with an entrepreneurial ecosystem, it is necessary to monitor the general performance as well as individual measures and their implementation. To draw conclusions on activities' effectiveness it is therefore also necessary not just to report performance data but to link the data to concrete activities and impact within the entrepreneurial ecosystem.

Among others, Autio et al. (2007) find that the most common metrics used are new firm formations as well as firm deaths over a period of time. While recognising that most governments are unable to track firm growth effectively, they point out that the absence of publicly reported performance data on high-growth entrepreneurship might lead to policy measures remaining ineffectively aligned to quantifiable outputs with no effect on entrepreneurial firm growth.

The City of Sydney tries to improve upon this issue with its “community indicator framework” outlined in chapter 2.2 and utilises various data inputs from official and unofficial sources such as community reports to measure the development of the regional entrepreneurial ecosystem. In regards to economic growth, the amount of angel and venture capital investment, the number of IPOs or exits is monitored in addition to the number of startups. Other performance indicators monitor networking events, number of participants, number of startups accessing City of Sydney affordable rental space and the city's ranking on global indices (City of Sydney 2016).

Unfortunately, these metrics might also not provide necessary insights to effectively manage the development of the entrepreneurial ecosystem. The number of startups and amount of investments are no definite indicators of progress and startups might very well be prosperous corporations with real impact on economic growth and job creation long before an IPO or exit.

The City of Hamburg also proposes metrics to track the measures outlined in the “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 (Untiedt 2014). These metrics mainly focus on financial performance data and are categorised as follows:

- Research & Development expenditures, differentiated by university, industry and government sector in relation to the gross domestic product (GDP)

-
- Research & Development personal in total and differentiated by university, industry and government sector in relation to the working population
 - Employment in research intensive industries and knowledge intensive services in relation to working population
 - Third-party funds raised by Hamburg university professors, differential by fund providers (industry, foundations, etc.)
 - Firm formation in research intensive industry and knowledge intensive services

Additionally the City of Hamburg aims to monitor success on a operational level through the Hamburgische Investitions- und Förderbank (IFB), tracking financial input and output variables, such as project costs or subsidies paid and number of jobs or revenues created, as well as specific outcomes benefitting the target audience.

Unfortunately no details on how and in what intervals the data will be obtained are available. Still the City of Hamburg aims to monitor measures and activities on project by project basis, linking activities to specific outcomes in the entrepreneurial ecosystem in addition to track the de-facto standard metric of new firm formations.

In regards to the triple helix approach the metrics proposed might prove valuable, since a continuing shift from a “laissez-faire” to a “balanced” model could be monitored with research & development expenditures moving more towards university and third-party funds raised by Hamburg university professors increasing over time.

To track the development of high-growth startups within the entrepreneurial ecosystem, it would be more prudent to track firms in their current stage of development by obtaining data on current phase within the startup’s lifecycle outlined in chapter 2.1. Since it is the general goal to stimulate economic growth and create jobs, it might be prudent to track if the percentage of startup reaching the growth stage increases over time or if the average time it takes a startup to get there accelerates.

This data might be hard or even impossible to gather and maintain through official data sources. Especially with potentially annual or even bigger intervals for many data points, it might also be very difficult to track the fast moving startup economy. Since community reported data might be biased it could prove unsuitable. Still it would provide a deeper insight into the vibrancy and dynamics of the entrepreneurial ecosystem and might therefore be a compromise worth exploring.

Privately operated initiatives like Hamburg Startups could be called upon to both comply with a minimum set of standards required by the City of Hamburg in exchange for receiving funds to monitor the entrepreneurial ecosystem in Hamburg. Especially data on firm formation and employment could be verified with official employment data while self reported data on phase of development, business model and funding received might prove invaluable in monitoring the evolution of the entrepreneurial ecosystem and align public support efforts accordingly.

7 Conclusion

This thesis explored the entrepreneurial ecosystem in the metropolitan area of Hamburg and the efforts undertaken or supported by the regional - and to some regard federal - government to foster entrepreneurship. Special attention was given to the media/IT industry cluster, a strategic focus outlined by the City of Hamburg in its various strategy documents and served by the nextMedia.Hamburg initiative as the networking entity for the creative industries in the region.

The document presents several insights into public policy towards entrepreneurship in Hamburg and suggest multiple areas for improvement. Analysis of the the “Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg” - regional innovation strategy 2020 and various nextMedia.Hamburg documents reveal several disconnects between academic research on public policy towards entrepreneurship and the practice in the City of Hamburg.

This is most evident in reviewing sources of information used in the city’s documents, use of jargon when using terms such as innovation or startup as well as in the vagueness of actions and metrics introduced. Despite strong focus on higher education and improvement of cooperation between government, industry and university as well as various cooperations with local research institutes prominently advertised, no academic input to the policy agendas could be identified whatsoever.

A disconnect between public policy makers and academic researchers might very well be a two-way street. The fact that educational importance and increasing relevance of local universities are acknowledged but resources are not used when forming public policy, might call for a more structured exchange of knowledge between government and university in terms of a “balanced” triple helix model.

Local scientists can be more proactive to ensure current research is known to relevant entities within the policy domains. Since policy-making does not rely on scientific process, it calls for a collaborative approach to make scientific findings available and understandable and to protect policy makers from romantic views of innovation and entrepreneurship advertised by non-targeted research and media coverage.

Additionally the metrics proposed by the City of Hamburg might prove ineffective to monitor and more importantly manage the public efforts to foster a prosperous development of the entrepreneurial ecosystem. With opportunities, business models

and startups themselves changing rapidly, flexible policy instruments need to be able to track changes and adjust accordingly, preferably in collaboration with adaptable measures at industry and university entities.

There are other areas in Germany struggling with similar issues. The state of Bavaria is particular progressive in this regards. As was illustrated, Bavaria - and arguably the City of Munich - has been very successful within the IT industry especially over the past decades, as is evident by Bayern Kapital's investment activities being among the largest in Germany. In 2015 the Zentrum Digitalisierung Bayern (digitisation centre) was initiated, bundling all digital activities within the state⁴⁷. It aims to connect industry and university through 6 Themenplattformen (topic platforms) and to create various innovation laboratories at universities all over Bavaria. Additionally, 20 professors will be hired, 10 research groups and doctoral programs will be initiated and entrepreneurship education will be strengthened with the goal to become the number one entrepreneurial location in Germany⁴⁸. With detailed information provided in various documents, the measures outlined advocate an innovative and “balanced” triple helix model with Bavaria’s universities taking the leading position in facilitating innovation towards economic potential.

Even more drastically, the professors Scheer and Wahlster propagate a “Digitalisierungsruck” (digital twitch) in their “Saarbrücker Manifest”, published in late 2016 on the occasion of the 10. Nationaler IT-Gipfel (national IT conference), to overcome challenges and exploit chances within the digital transformation⁴⁹. Claiming Germany’s potential to reach a leading position in rising industries such as internet of things, real time internet and autonomous systems, they quite vigorously demand massive investments, wilful readiness to assume risk and disruptive changes in surrounding conditions in policy, industry and university as well as society itself.

⁴⁷ Zentrum Digitalisierung.Bayer, 2016. Zentrum Digitalisierung.Bayern. *zentrum-digitalisierung.bayern*. Available at: <http://zentrum-digitalisierung.bayern> [Accessed November 25, 2016]

⁴⁸ Bayerisches Staatsministerium für Wirtschaft und Medien, Energie und Technologie, 2016. Zentrum Digitalisierung.Bayern. *stmwi.bayern.de*. Available at: <https://www.stmwi.bayern.de/digitalisierung/bayern-digital/zentrum-digitalisierung-bayern> [Accessed November 25, 2016]

⁴⁹ Scheer, A.-W. & Wahlster, W., 2016. Aufforderung zu einem “DIGITALISIERUNGSRUCK - Herausforderungen meistern, Chancen nutzen”. *scheer.group.com* Available at: https://www.scheer-group.com/Scheer/uploads/2016/11/Scheer_Saarbr%C3%BCcker-Manifest.pdf [Accessed November 26, 2016]

In order for Germany - and subsequently regional areas such as Hamburg - to remain competitive in a global struggle for innovation and its commercialisation as a driver of economic growth, the position of Scheer and Wahlster seem both radical and inevitably necessary at the same time. Only through decisive actions and massive investments it seems feasible not to be doomed as a mediocre habitat with the creative potential being nurtured and employed in the U.S., Asia or somewhere else.

8 References

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9 Figures

Figure 1.....p11

How Startup Funding Works

taken from:

Vital, A., 2013. How Funding Works - Splitting The Equity With Investors. *fundersandfounders.com*. Available at: <http://fundersandfounders.com/how-funding-works-splitting-equity/> [Accessed November 2, 2016].

Figure 2.....p13

Startup funding at different stages of development

own illustration based on:

Graham, P., 2005. How to Fund a Startup. *paulgraham.com*. Available at: <http://www.paulgraham.com/startupfunding.html> [Accessed November 2, 2016].

Ripsas, S. & Tröger, S., 2014. #DSM - Deutscher Startup Monitor. *Deutscher Startup Monitor*, 2014, pp.1–64. Available at: http://deutscherstartupmonitor.de/fileadmin/dsm/dsm-14/DSM_2014.pdf [Accessed November 8, 2016].

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Figure 3.....p18

Domains of the Entrepreneurship Ecosystem

taken from:

Isenberg, D.J., 2011b. The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship. *IIEA Dublin 2011*, pp.1–13. Available at: <http://entrepreneurial-revolution.com/2011/05/11/the-entrepreneurship-ecosystem-strategy-as-a-new-paradigm-for-economic-policy-principles-for-cultivating-entrepreneurship/> [Accessed November 1, 2016b].

Figure 4.....p19

Entrepreneurship Ecosystem used in “Deutscher Startup Monitor” based on Isenberg (2011b)

taken from:

Ripsas, S. & Tröger, S., 2014. #DSM - Deutscher Startup Monitor. *Deutscher Startup Monitor*, 2014, pp.1–64. Available at: http://deutscherstartupmonitor.de/fileadmin/dsm/dsm-14/DSM_2014.pdf [Accessed November 8, 2016].

Figure 5.....p20

The Entrepreneurial Ecosystem Canvas

taken from:

Compass & Funke, T., 2016. The Global Startup Ecosystem Report 2015 v1.2. *Compass*, pp.1–156. Available at: https://s3-us-west-2.amazonaws.com/compassco/The_Global_Startup_Ecosystem_Report_2015_v1.2.pdf [Accessed November 4, 2016].

Figure 6.....p21

Key elements, outputs and outcomes of the entrepreneurial ecosystem

taken from:

Stam, E., 2015. Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), pp.1759–1769.

Figure 7.....p29

Thematic Categorization of High-Growth Entrepreneurship Support Measures

taken from:

Autio, E., Kronlund, M. & Kovalainen, A., 2007. High-Growth SME Support Initiatives in Nine Countries: Analysis, Categorization, and Recommendations. *Finnish Ministry of Trade and Industry*, 2007(1), pp.1–92.

Figure 8.....p32

Revenue trends in the cultural and creative industries in German media locations from 2006 to 2013 in EUR million

Source:

Hamburg Chamber of Commerce, 2015b. Media City: Hamburg A. Ulrich & N. Zimmermann, eds. *hk.de*, pp.1–44. Available at: <https://www.hk24.de/blob/hhik24/produktmarken/branchen/it/downloads/2764256/e878855cc5873dd8be88965d9a032e8d/Analysis--Media-City-Hamburg--data.pdf> [Accessed November 1, 2016b].

Figure 9.....p41

Category of startups monitored by Hamburg Startup Monitor

taken from:

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Figure 10.....p41

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taken from:

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taken from:

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Available at: <http://monitor.hamburg-startups.net/stats> [Accessed November 1, 2016].

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Hamburg subsidy system

own illustration and translation based on:

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own illustration and translation based on:

Untiedt, G., 2014. Regionale Innovationsstrategie 2020 der Freien und Hansestadt Hamburg. *hamburg.de*, pp.1–177. Available at: <http://www.hamburg.de/contentblob/4612440/f4fbf213d2c3e9136e83337595f52821/data/regionale-innovationsstrategie-hamburg.pdf> [Accessed November 20, 2016].

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10 Tables

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Source:

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Source:

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Source:

Hamburg Chamber of Commerce, 2016a. Kapitalbeteiligungsgesellschaften in Hamburg. *hk.de*. Available at: https://www.hk24.de/produktmarken/branchen/finanzwirtschaft-versicherungen/service/venture_capital_liste/1158930 [Accessed November 2, 2016a].

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11 Appendices

Appendix 1: Startup Location Hamburg Infographic

interactive version available at <http://www.nextmedia-hamburg.de/startup-location-hamburg> [Accessed November 16, 2016]

1 of 5





PROXIMITY TO CUSTOMERS, STRATEGIC PARTNERS AND SERVICE PROVIDERS



**STRONG SERVICE SECTOR
WITH LEADING COMMERCIAL
AND ONLINE COMPANIES**



**INNOVATIVE AND TRADITIONAL
MEDIA METROPOLIS**



**CENTRE OF THE GERMAN
CREATIVE INDUSTRIES**

UNIVERSITIES

Over 100,000 students study at a total of 36 universities in the Hamburg Metropolitan Region, of which approx. ten percent come from abroad.

University courses on the subject of entrepreneurship, such as those offered at the inter-university start-up dock (TU Hamburg-Harburg), the Fresenius University in Hamburg, the Wedel University for Applied Science as well as the Leuphana University of Lüneburg combine academic knowledge with practical approaches for the successful implementation of start-up projects.

The educational programmes are also supplemented by numerous internationally renowned research institutions such as the Max Planck Institute or the DESY in Hamburg. The 10,000+ researchers are a major driver of innovation.

QUALIFIED EMPLOYEES



INTERNATIONAL LOCATION

INTERNATIONAL COMMUNITIES

INTERNATIONAL COMPANIES

INTERNATIONAL NETWORKS

INFRASTRUCTURE

Hamburg offers ideal conditions to not only reach, but also support branches, customers and projects within Germany and also on an international basis.

The port of Hamburg, one of the leading seaports worldwide, provides good access to the North and Baltic Seas via the Elbe. The city is also well connected to the rest of Europe using road and rail, and Hamburg Airport offers daily domestic, European and international flights to many destinations.

The infographic features a blue upper section with a white location pin icon connected by dashed lines to three circular icons representing international communities, companies, and networks. A white paper airplane icon is shown flying towards the right. The lower section is red and contains a white airplane icon with motion lines, a white ship icon, and stylized white road and rail tracks.

QUALITY OF LIFE

It is no coincidence that Hamburg, whose municipal area consists of more than 16.7 percent of forests, recreational and green areas, was crowned European Green Capital in 2011. Numerous parks, the Elbe and the Alster as well as many smaller canals shape the image of the Hanseatic city.

Hamburg regularly occupies one of the top places for quality of life in comparative studies (e.g. Mercer 2014, XING 2013, YouGov 2013). The high attractiveness of the city draws in excellently trained professionals and facilitates employee recruitment.

Hamburg is a cultural city: Up to 6,000 events take place in the metropolitan region every month - from concerts to dramas, musicals, readings to exhibitions, sports events or festivals. There are more than 60 theatres, over 100 music clubs and around 60 museums in Hamburg. More than 10,000 self-employed artists live in the city.

www.nextmedia-hamburg.de

12 Glossary

AdTech	Advertising Technology or AD serving Technology is used for ad placement on websites and might include services such as ad serving, analytics, targeting, attribute modelling, etc.
Artificial Intelligence	Artificial Intelligence is “intelligent” or “cognitive” behaviour shown by machines that is usually attributed to humans. An intelligent machine perceives its environment and optimises its actions to reach preferred outcomes.
Business model	A business model is a plan for the operation of a business and includes sources of revenues, customers and means of financing.
Buy-out	A Buy-out is the acquisition of controlling shares in a company
Company Builder	A Company Builder is a firm that specialises in the foundation and buildup of startups. Many incubators describe themselves as company builders although there are company builders who only create small prototypes or minimum viable products to broker these to potential investors.
Co-working	Co-Working involves working in a shared working environment. It often entails sharing office resources with people not employed by the same company and is commonly used by small firms or freelancers to reduce fix costs.
Cloud computing	Cloud computing utilises remote servers hosted in data centres to store, manage and process data. Other than with using local computer resources, cloud computing allows shared resources to be used on demand.

dot-com-bubble	The dot-com-bubble, often called internet bubble or dot-com collapse, was the historic investment bubble that bursted in 2001 after a period of rapid growth in the internet industry in the late 1990ies.
eCommerce	Electronic Commerce, often referred to as online shopping, is the trading in products or services through websites or online networks.
Exit	An Exit refers to a company's Exit strategy, the plan to transition the equity ownership of a company to another owner, e.g. through a merger or acquisition or to investors through an initial public offering (IPO) at a stock exchange market.
FinTech	Financial Technology describes an industry sector using emerging technology for financial service products and innovation within the financial services industry in general.
Hackathons	Hackathons are events during which programmes and other interested parties collaborate on hard- or software projects. Events usually have a theme and are organised utilising design thinking methodology.
High-Technology	High-Technology, often referred to as high-tech or hi-tech, describes the most advanced technology available, usually in computer electronics.
Market fit	Market fit describes a product that satisfies requirements of a given market, therefore being potentially successful within in.
Metrics	Metrics or Performance metrics is what determines performance of a company or activity. It aims to quantify in criteria such as safety, time, costs, resources, scope and quality among others.

Minimum Viable Product	A Minimum Viable Product, often called MVP, describes a product with the minimum set of features to gather data and insights about the product and its development.
Smart-City	A Smart-City is a urban development perspective in which technologies such as ICT and Internet of Things (IoT) are integrated in city's assets such as infrastructure, information systems, community services etc.
Succession	Succession is the process of identifying and securing new leadership for a company, often aligned with new ownership structures. It is a process often used when old company leadership or owners leave, retire or die.
Unicorn startup	A "unicorn" startup is a startup with a valuation of over USD 1 billion and a metric many startups a measured against.
Venture capital	Venture Capital, often called VC, is a specific type of private equity used to fund small, early stage firms with high-growth potential.

13 Abbreviations

ACS	American Community Survey
AI	Artificial Intelligence
BDS	Business Dynamics Statistics
BVK	Bundesverband Deutscher Kapitalgesellschaften e.V. (German Private Equity and Venture Capital Association)
BEEP	Babson Entrepreneurship Ecosystem Project
CBD	Central Business District
CRM	Customer Relationship Management
CSTI	Creative Space for Technological Innovation (research lab at Hamburg University of Applied Sciences)
CUNY	The City University of New York
DACH	Deutschland, Österreich, Schweiz (Germany, Austria, Switzerland)
DPA	Deutsche Presse Agentur
DMV	#DMV Digital Media Women
DTCO	Deutsche Telekom Capital Partners
DTSI	Deutsche Telekom Strategic Investments
EAQ	Entrepreneurial-Activity-Quote
EFRE	Europäischer Fonds für regional Entwicklung (European funds for regional development)
EMBA	Europäische Medien- und Business-Akademie
ESF	European Social Fund
EU	European Union
EUR	Euro
FIABCI	Internationaler Verband der Immobilienberufe FIABCI
FinTech	Financial Technology
GDP	Gross Domestic Product
HAW (Hamburg)	Hochschule für Angewandte Wissenschaften Hamburg (Hamburg University of Applied Sciences)
HEI	hei. Hamburger Existenzgründungsinitiative
HFBK (Hamburg)	Hamburger Hochschule für Bildende Künste (Hamburg University of Fine Arts)
HI	Hamburg Innovation
HH	Hansestadt Hamburg

HHIS	#HHIS Hamburg Innovation Summit
HMS	Hamburg Media School
HTGF	High-Tech Gründerfonds
HWF	Hamburgische Gesellschaft für Wirtschaftsförderung mbH (Hamburg Business Development Corporation)
IBB	Investment Bank Berlin
ICGT	InnovationsCampus Green Technologies (at Hamburg University of Technology)
ICT	Information and Communications Technology
IFB	Hamburgische Investitions- und Förderbank
IHM	Interessengemeinschaft Hamburger Musikwirtschaft
IP	Intellectual Property
IPO	Initial Public Offering
IT	Information Technology
KfW	Kreditanstalt für Wiederaufbau
KPI	Key Performance Indicator
LIB (Hamburg)	Landesbetrieb Immobilienmanagement und Grundvermögen
M	Million
MVP	Minimum Viable Product
NEA	New Enterprise Associates
NETS	National Establishment Time Services
NIT	Northern Institute of Technology Management Hamburg
NMA	Next Media Accelerator
PDF	Portable Document Format
Q1	Quarter 1
Q2	Quarter 2
Q3	Quarter 3
Q4	Quarter 4
QCEW	Quarterly Census of Employment and Wages
QWI	Quarterly Workforce Indicators
R&D	Research & Development
SaaS	Software-as-a-Service
SEO	Search Engine Optimisation
SME	Small and medium-sized Enterprises
SXSW	South-by-South-West

TED	Technology, Education, Design
TIE	Institute of Entrepreneurship (at Hamburg University of Technology)
TIP	Telekom Innovation Poo
TUHH	Hamburg University of Technology
TUTECH	TuTech Innovation
TV	Television
USD	United States Dollar
USP	Unique Selling Proposition
USV	Union Square Ventures
VC	Venture Capital
WDR	Westdeutscher Rundfunk
ZIE	Zentrum für Innovation & Entrepreneurship (at Hamburg University of Technology)

Versicherung über Selbstständigkeit

Hiermit versichere ich, dass ich die vorliegende Arbeit ohne fremde Hilfe selbstständig verfasst und nur die angegebenen Hilfsmittel benutzt habe.

Hamburg, den 05.12.2016
