UNIVERSITY OF AMSTERDAM

Graduate School of Humanities
Faculty of Humanities, University of Amsterdam

Media Studies Research Master
Thesis
August 15th, 2016

Tracing the Social:
A mixed-method approach to startup ecosystems

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ABSTRACT

How can something as complex as a local startup ecosystem be understood, captured and reproduced? Research addressing this question is mostly focussed on the United States, most notably Silicon Valley. Consequently, many models produced by this research presuppose an American sociopolitical system. The current body of literature on entrepreneurial ecosystems portrays the effort to understand such a complex phenomenon as one diagram-like system, existing of enumerated assets such as attributes, principles, pillars or components. Overall, these studies fail to acknowledge or incorporate the networked nature of such an entrepreneurial ecosystem.

This research project proposes a new approach to entrepreneurial ecosystems by making the 'networkedness' of these ecosystems central to the methodology. Building on digital methods, this investigation repurposes Twitter to unveil the affiliation network of Dutch social startups. Moreover, it employs bottom-up interview techniques as an alternative approach to understanding an ecosystem. Drawing from this material, the organisational mechanisms at work in the Dutch startup ecosystem will be scrutinised by tracing the networks in which a selection of five social startup entrepreneurs is entangled. These networks include a variety of actors: besides the startups themselves, organisations that facilitate integration and cross-community communication are also present within the ecosystem.

The aim of this thesis is to evaluate the added value of a network-driven methodology to entrepreneurial ecosystems. Collaborative readings of the network graphs produced from the collected Twitter data shows both the validity of network analysis, but it also demonstrates the limitations of digital methods research and static network graphs. An entrepreneurial ecosystem is a messy network of contributors, which can be depicted in a network graph. Such a graph is useful for exploratory purposes, but to interpret, understand and explain the complexities behind the colourful figures, qualitative field research is needed. This project shows how such a mix methods approach can be operationalized.

ECONOMIC CLUSTERS in the AGE of REPRODUCTION

In the first episode of the popular HBO comedy series Silicon Valley (Mike Judge, 2014) we meet Richard Hendricks, a shy and somewhat geeky programmer working at a generic tech corporate in Silicon Valley. Since renting a flat is too expensive, he lives in a startup incubator with a couple of entrepreneurial friends, run by a tall and bearded guy who enjoys meditation retreats, and walks around on sandals. Richard builds an application called Pied Piper that can easily crop, crunch and compress music files to search the internet for possible copyright infringement of any newly made song. Other programmers at the Silicon Valley tech company make a fool of him, but when they later check the application he built, the compression techniques appear to be of extraordinary quality. In the next scene, two investors are bidding up to buy the entire - or a percentage of the company for respectively 10 billion or 200.000 dollars for 5 percent of the shares while poor Richard is about to have a nervous breakdown. At the incubators home, he decides to keep the company for himself and only sell the shares, explaining: “look guys, for thousands of years guys like us have gotten the shit kicked out of us. But now, for the first time, we are living in an era where we can be in charge and build empires. […] We could be the Vikings of our day” [...]. A painful silence follows while the roommates watch each other, then finally asking “who do you mean by ‘we’?”. At night, while smoking pot and drinking beer Richard makes a toast: “I'd like for this company to be different from Hooli and Goolybib and all the rest, you know? Like, let's not turn this into a corporate cult with bike meetings and voluntary retreats that are actually mandatory, and claiming to make the world a better place all the time” (Mike Judge, 2014).

In a remarkable podcast series, the listener follows American radio journalist Alex Bloomberg (2014) reporting on the founding of his fast-growing podcast company including all ups and downs it takes. In the first episode, he introduces his wife and two kids and says goodbye to his former life with a stable dual income. He quits his job to start his company and is in desperate need of capital to make it possible. We hear him explain the story he tells himself: "I am the guy in the garage with the great idea, I am the Steve Jobs", continued by an evaluation of his prospects "of course I am not Steve Jobs. Of the hundreds and thousands of businesses that start each year, only three out of ten survive the decade" (Alex Bloomberg, 2014). In the next scene, the listener eavesdrops into an early funding interview Alex has with the Silicon Valley venture investor Chris Sacca he knew from high school -what in startup vernacular is called an 'angel investor'. Attending the conversation as they are walking down the boulevard, Alex is pitching his idea, which unfortunately does not go too well. In return, Sacca starts coaching him to make his story more convincing and coherent giving both the pitch in favour of- and against investing in the podcasting company. Then Alex realised: "Chris is not looking for a nice profit, he is looking for the next Twitter" (ibid.). Over the following episodes, the podcast unfolds a most honest account what it means to figure out the right circumstances to grow your own business.

The HBO comedy series portrays an exaggerated and stereotypical version of what Silicon Valley's everyday life would look like. It embodies Silicon Valley as an American export product in the form of a television show: this is the Silicon Valley that gives a face to thriving corporate America. It is the place where the future is invented, where capital flows freely and where tremendous growth rates are a given, even in times of economic recession. It is the heart of the American tech industry, as it has been for the past four decades. While the internet bubble of 1995 -partly born in Silicon Valley- imploded, investors still kept coming, and companies kept growing. (Thiel & Masters, 2014). Therefore, this economic cluster is envied by many; entrepreneurs wishing to kickstart such a thriving entrepreneurial scene, corporations in need of innovative practices and governments that seek to proliferate their national economy. In the second example,

Bloomberg's podcast portrays someone who tries to get an idea transformed into a working business model, ready to scale. Through interaction with different investors, consultants, and other parties, his podcast unveils the struggles to get the right people involved. The first sparring partner one listens to was his wife, but over several episodes he is talking to consultants, friends, fellow entrepreneurs, mentors, investors and others. Any starting entrepreneur is in need of workspace, a knowledge network, venture capital, mentoring and sometimes government funding, and Bloomberg illustrates a fledgeling company does not grow in a vacuum but is dependent on many other players contributing to the soil that enables their advancements.

The notion that an economic cluster can be understood as a mixture of organisations, institutions, and entrepreneurs contributing to the fertile ecosystem is expressed through a concept central to this thesis. The entrepreneurial ecosystem and, more specifically, the startup ecosystem both draw on the biological metaphor of a system of participants tied together through interdependent relationships (after Odum, Odum, & Andrews, 1971). The body of literature on the entrepreneurial ecosystem shows various attempts have been done to grasp its essence through a proper methodology, with mixed results. Often local self-proclaimed experts and sometimes academic researchers have tried to build a model in which one or more case-studies are translated into a more general theory of what an ecosystem would comprise. Some have aimed for a simple and consolidated understanding of what makes an economic cluster successful, while others have tried to develop a blueprint suitable for the reproduction of an ecosystem in a different context. If one takes the various concepts underlying these ideas together, it mainly shows the entrepreneurial ecosystem helps to think about a complex phenomenon like Silicon Valley in its totality without a strict consensus on its definition.

Early observations of economic clusters proved that the evolution of local economies cannot be understood when looking at traditional explananda alone, and urge the need to include network theory to understand the difference in the development of similar economic clusters (Saxenian, 1996). This idea evoked the perception of an

entrepreneurial ecosystem as a network in which companies and entrepreneurs are closely tied together through complex heterogeneous relationships. Although the notion of the network has been employed in earlier studies, contemporary models describe an entrepreneurial ecosystem in terms of attributes, principles, pillars, actors or components which makes it impossible to thoroughly incorporate the implications of this 'networkedness' (Stam, 2014). Over time the quest to create a one-size-fits-all solution for policy makers grew towards a more essentialist theory taking the shape of a blueprint or supposed ideal ecosystem. Additionally, attempts to reproduce a successful economic ecosystem in practice have not delivered on their promise (Hospers, Desrochers, & Sautet, 2009), and more recently authors even warn not to try to reproduce Silicon Valley (Duff, 2016; Isenberg, 2010; Stam, 2014).

Rather than working towards a new ideal type, there is a need for a more context-specific startup ecosystem methodology, which cannot only help scholars studying such ecosystems, but also policy makers and entrepreneurs themselves. In critical dialogue with dominant US literature, this paper distances from the idea of reproduction and will instead dive into the local ecosystem with its European sociopolitical context. It will develop an alternative approach by looking at particular startups in the Dutch startup ecosystem through a bottom-up approach to see what is present rather than framing what is missing[1].To allow the specificities of an ecosystem to reveal itself, a network-driven approach is developed which builds on aggregated Twitter data combined with interviews with participants on ground level. The paper explores the mechanisms of the Dutch entrepreneurial system by looking through the eyes of the Twitter accounts of

[1] In addition, one could argue another reason for a European enquiry is the different role the government has within the institutional framework compared to the United States. However, the research does not focus on a different understanding of governmental bodies in policy making and funding of the startup ecosystem between the US-based case-studies and a Dutch enquiry for two reasons. The first being the government is often an integral part of the US-approaches too, not relying on laissez-faire politics alone. The second being the practical reason that the role a government plays with tax breaks, institutional recognition, legal regulation, policy research and so on is hard to operationalize through a Twitter-driven method, for few politicians or government related organisations are active Twitter participants.

close to 600 Dutch startups, zooming in on the most innovative startups which are at the same time the most fragile: social entrepreneurs with high-growth potential. Lead by an impact-first mentality these enterprises are more dependent on their professional affiliate networks compared to regular profit-first startups. This research is meant as a methodological enquiry to contribute to the field of entrepreneurial ecosystem studies based on a network-driven approach. It reflects on the added value of combining aggregated Twitter data with interviews as a mixed-method approach to the functioning of the Dutch ecosystem.

The following theoretical discussion in the first chapter starts by contextualising the entrepreneurial ecosystem in a historical context, drawing on early cybernetics, a peculiar cultural merge in 1990's Silicon Valley, and the rise of new social and informational infrastructures. The advantages and shortcomings of the current entrepreneurial ecosystem are briefly illuminated in the second chapter, to subsequently propose the transition from a 'network theory' as part of the early ecosystem concept to 'network practices' as the core of a methodological enquiry. A small but concise excursion in the background of social entrepreneurs in the Netherlands helps to contextualise the research, and it is followed by a methodology to explain the interpretative framework and the technicity of the tools used to acquire the right data. The third chapter will start with a simple operationalization of the large Twitter database explained as an affiliation network. This large network is triangulated with semi-structured interview data in the fourth chapter, first of all, to explain the mechanisms at work underneath these network structures and secondly, to delve into the advantages and limitations of this mixed-method approach. The fifth chapter will outline the benefits and disadvantages of the alternative approach presented in this paper over the existing more established traditions, to conclude with a short evaluation on the generalizability of the proposed research method.

I. the SILICON VALLEY MODEL

The entrepreneurial ecosystem captures something as intangible as a milieu or environment -to stay within the biological metaphors- into a rather tangible system. To imagine an entrepreneurial ecosystem as a closed system with a finite number of actors linked together through (mutual) relationships elicits the idea one can grasp the phenomenon in its entirety. The consequential analysis closely resembles system thinking, and can be traced back to the birth of cybernetics. The first part will discuss the historical context of the entrepreneurial ecosystem through cybernetics, system thinking, the network entrepreneur and the development of the social web. The second part will contextualize the entrepreneurial ecosystem concept, in the first place drawing on the natural sciences notion of ecosystem, to subsequently highlight the central role Silicon Valley had in the development of the field of study. Third, a review of literature will show what research has been done by discussing the Boulder thesis by Feld (2012) and the imperatives by Isenberg (2010, 2011). It will be interspersed with a small empirical research to show the bias towards American case-studies, followed by a discussion of the worldwide research done by the World Economic Forum. Fourth, built on the critique of Stam (2014), the problematization will be followed by a proposition for a different starting point of inquiry. Fifth, after a short recapitulation, a specific type of internet research will be introduced, fruitful to later operationalize a proper methodology. Sixth, the chapter will finally introduce the case-study used, being social entrepreneur-based startups in the Netherlands. The last section will shortly introduce the status quo of startups in the Netherlands, elaborate on the 'social entrepreneur', what it means to be a 'startup', and consequently what the composite 'social startup' would look like.

But first, this chapter will provide a concise historical context based on four particular moments: birth of cybernetics, system thinking, arrival of the network entrepreneur and the rise of the social web.

In the 1930s, the mathematician and founding-father of cybernetics, Norbert Wiener, helped design new warfare technology for airplanes and anti-aircraft guns (Turner, 2006). After the Second World War, the development of information technologies was seen in light of the Cold War, and political and financial motivations stimulated technological progress in Silicon Valley (ibid.). Wiener would represent the machinery in diagrams made of components linked together by information, a practice that would later be the basis for the “science and control of communication in the animal and the machine”, coined as 'cybernetics' (Wiener, 1961). He worked together with scientists, engineers, and technicians in several research laboratories where cybernetics helped to imagine 'institutions as living organisms' and 'social networks as webs of information' (Turner, 2006).

Over time, cybernetics transcended the system-like representation of technologies, to include social and political issues in a more general interdisciplinary system thinking trend. With cybernetics and early system theory, a new paradigm was introduced to study complex phenomenon through the integrative holistic and systematic view that everything is tied together beyond the human and the non-human divide. Silicon Valley, with its cultural specificities, is one of the protagonists in the collapse between the war-originated cybernetic paradigm and the Californian countercultural movement of the time. Fred Turner, in his extensive work *From Counterculture to Cyberculture*, argues that part of this powerful Californian countercultural movement was scattered into smaller groups in need of an overarching organising principle to think themselves as one community (2006). Just around the corner of Silicon Valley, the back-to-the-land movement proliferated, fuelling anti-bureaucratic sentiments in post-war San Francisco. Around the same time, the Bay Area entrepreneur Steward Brand developed the Whole Earth Catalog in which he teamed up with journalists, scholars, and entrepreneurs to reappropriate new technological inventions, coming from both scholarly- and industrial research, for social networking means. Turner argues the catalog has played an important role in combining the countercultural New Communalists with the cybernetic paradigm ironically built on "intellectual frameworks and social ideas formulated at the

core of military research culture" (p. 57). In this peculiar spillover, the Californian counterculture movement collided with cybernetic ideas living in the post-war and entrepreneurial spirit of the Bay Area.

In the 1980s, another war-industry born invention had been appropriated for personal use, the world wide web, making way for a new concept, the network entrepreneur. With new possibilities to team up through email and online platforms like the WELL, artists, scholars and businesspeople came together to find computer and machine coincide in new ways. At that time, Steward Brand started the interdisciplinary futurist think-tank 'the Global Business Network' which turned into a major consultancy company. Many large technology firms tapped into this pool of new ideas through membership affiliation with the Global Business Network. Brand, who was hopping from community to community, could be considered an early 'network entrepreneur' (Burt, 2000): an entrepreneur who can live from his or her professional network, and who would "knit together formerly separated intellectual and social networks"[2] (Turner, 2006, p. 5). In broad strokes, Turner sees the Whole Earth Catalog as one of the precursors of the egalitarian and democratic utopia of the net in which new technologies were appropriated to empower alternative communities without direct state intervention. And so, as the networked capacities of the internet unfolded they did not thrive on collective freedom 'sought by hippy radicals' but rather on the collective liberty of the individual (Barbrook & Cameron, 1996). With system theory being “a contact language and structuring principle” (Turner, 2006, p. 87), the renewed perception of community and the commons overlap with notions of the autonomous networked individual.

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[2] In light of the New Communalist movement. Later the networked entrepreneurship became the cornerstone of Silicon Valley, it became the mantra of its working, its culture, and its organizational form. Only for a limited time minds and assets would come together in the same space to work with tremendous throughput, sometimes leaving the next month to work on a new idea or find a new job offer. The networked entrepreneur works day and night on constantly shifting jobs while boundaries between public and private, work and leisure time slowly crumble to become one flow (Duff, 2016).

It is the same countercultural network entrepreneur that is at the heart of the early incubation of social web platforms like Facebook, Twitter, and LinkedIn. In *Status Update*, former Microsoft-based anthropologist Alice Marwick conducted an ethnographic research over the years 2006 and 2010 when she followed Silicon entrepreneurs who would contribute to what is called 'the social web' or the 'web 2.0' (2010) during their everyday lives. Together with the celebrated potential of liberation and participation rooted in the net utopia, she notes a comfortable fit between the entrepreneurial neoliberal paradigm and the ideologically driven background of these New Communalists' offspring -to keep with Turner's naming. In their pursuit of personal status, the technologies they develop help self-branding and other forms of digital self-actualization to reach a new level of networked individuality. Perhaps the collapse of cybernetics, system thinking, and the networked individual represents a shift in focal point. Where the first two argue for an integration of both human and technology into one system oriented understanding, the last made way for the reborn and enhanced networked individual as the dominant unit of analysis standing above the system itself.

With Silicon Valley explicated as the centre of gravity around this small historicized context, we can now start to delve into the entrepreneurial ecosystem as a concept. The following section will first elaborate on the ecosystem deriving from the natural sciences, to subsequently show how it has been used to understand and grasp economic clusters, Silicon Valley in particular and the field of entrepreneurial ecosystem studies.

Adjacent to the interdisciplinary system-thinking paradigm, the ecosystem metaphor derived from a biological perspective. It employed a similar understanding of phenomena through the use of a holistic, interwoven system, but this time, it is used to describe the workings of the animal and the non-animal together. The ecosystem was first employed to describe the qualitative analysis of biological cells on a molecular level since the cell was initially researched in quarantine (Odum, Odum, & Andrews, 1971). However, researchers were quick to discover that a cell operates in a complicated

entanglement with its neighbours. The book *Ecosystems* by Odum describes this transition from a simple cellular level to the attention paid to the cell within a system of organised complex relationships (idem.). The ecosystem metaphor can now be found in disciplines like information sciences, cognitive science, media studies, and economics. And since ecosystem studies have arrived at a later time and draw on the same sort of system analysis, they arguably resonate closely with cybernetic thinking. Perhaps the ecosystem can be thought of as the metaphysical or biological variety of system thinking drawing on the ecological world.

Though Silicon Valley might be at the top of the world's innovative entrepreneurial ecosystem -it is by far not the only site of tremendous technological prosperity. Just after the Second World War, Boston was growing into a competitive site of innovation with similar war-related (IT) industries. Over time, both places were considered "self-reinforcing agglomerations of technical skill, venture capital, specialised input suppliers and services, infrastructure, and spillovers of knowledge associated with proximity to the university and informal information flows" (Saxenian, 1996, p. 42). However, where Silicon Valley became a story of consecutive successes, Boston's Route 128 experienced a slow but sturdy decline in both size and revenue, to finally be abandoned by its largest multinationals. The differences between Route 128 and Silicon Valley, Saxenian argues in *Inside-out: regional networks and industrial adaptation in Silicon Valley and Route 128*, cannot be explained by drawing on conventional proximity and agglomeration theory alone. In what can be considered the harbinger of the 'entrepreneurial ecosystem', Saxenian turned to network-theory to justify the contrast in fate between the two, professional connectedness being pivotal to their existence.

As Silicon Valley offers a peak in the constant near-future, it became a cultural and economic model in many ways, a centre of gravity. The region has been idolised[3] not only for its technological inventiveness and access to financial means, but also its

[3] The word 'idolization' has been used because it is a non-critical term, turning a blind eye to local gender inequalities, minority issues and other sociopolitical problems (eg. Garreau, 1994; Shankar, 2008).

lifestyle and working regime have being projected as the ideal emancipated egalitarian meritocracy (see for instance Garreau, 1994; Shankar, 2008). It portrays the vision of a future in which technology can -and will- make social change for the better, a tomorrow that is driven by a continuous craving for more information. Over time, an entire series of entrepreneurial ecosystem studies has been devoted to outline and map Silicon Valley's beneficial factors in the hope to replicate the right conditions for a prosperous economic cluster elsewhere. Political and economic motivations interlock in an effort to capture its essence through system thinking models inherited from early cybernetics for if one would be able to unveil the workings of an entrepreneurial ecosystem, it might be turned into a valuable prototype or blueprint.

Since the 1990s, the network-theory induced analysis by Saxenian (1996) has progressed into new fields of research that explore economic clusters now understood as entrepreneurial ecosystems. However scholars, politicians and serial entrepreneurs seem to derive their understanding of an economic cluster from a canonical set of case-studies. In return, anyone with sufficient knowledge about a healthy economic cluster can become an expert; a broker of the system. And still, it is hard to translate an intensely intertwined network of entrepreneurs, venture capitalists, consultants, spokespersons, research institutes, incubators etcetera into a generalizable theory, let alone burn one's fingers on more cultural aspects. Nevertheless, experts claimed to have found the Holy Grail to establish a thriving entrepreneurial ecosystem about anywhere.

A short literature review will discuss three entrepreneurial ecosystem studies. Firstly the 'Boulder thesis' by Brad Feld, secondly 'the nine imperatives to a healthy ecosystem' by Daniel Isenberg. After a short analysis, a small empirical research exemplifies the strong connection between studies of ‘startup companies’ and the ‘United States’. This geopolitical bias makes the third study, a worldwide comparative entrepreneurial ecosystem by the World Economic Forum, evermore important to discuss.

Meant as a mere handbook or manual, Co-founder of the TechStart Accelerator Network Brad Feld (2012) explains how to build an entrepreneurial ecosystem in your city.

Although Silicon Valley has been the dominant subject of scrutiny, the efforts to get to a more general theory fortunately reflect more than just one case-study. By drawing on his own experience moving out of Boston's established and safe entrepreneurial harbour to a Colorado village called Boulder, he employs a list of assets[4] he argues to be obligatory for any healthy ecosystem. Like a DIY construction kit with a somewhat complicated instruction manual, the 'Boulder thesis' -as he calls it - is one out of many models devoted to make the entrepreneurial ecosystem into a toolkit for policy-makers or entrepreneurs to use. Yet there is only one authentic Silicon Valley which cannot be reproduced under any circumstances.

"Stop replicating Silicon Valley" is the first verdict by Daniel Isenberg, Massachusetts professor of management practices, who published an article with the telling subtitle: *To ignite venture creation and growth, governments need to create an ecosystem that sustains entrepreneurs. Here is what really works* (Isenberg, 2010). The paper argues governments need to advance a system that provides entrepreneurs in their needs, a government which facilitates rather than restricts. With eight other imperatives[5], Isenberg helps 'governments around the world' to 'transform their economies' (ibid.). In another work of his, Isenberg builds a popular model of what an ecosystem should be. Based on his international activities in multiple 'super-venture' societies, he presents a blueprint for a productive ecosystem, consisting of six domains (Isenberg, 2011).

[4] Being: the presence of leadership, intermediaries, network density, government, talent, support services, engagement, companies and capital (Feld, 2012).

[5] Respectively: Stop Emulating Silicon Valley, Shape the Ecosystem Around Local Conditions, Engage The Private Sector from the Start, Favor High Potentials, Get a Big Win on the Board, Tackle cultural Change Head on, Stress the Roots, 'Don't Overengineer Clusters; Help Them Grow Organically' and 'Reform Legal Bureaucratic, and Regulatory Frameworks' (Isenberg, 2010).

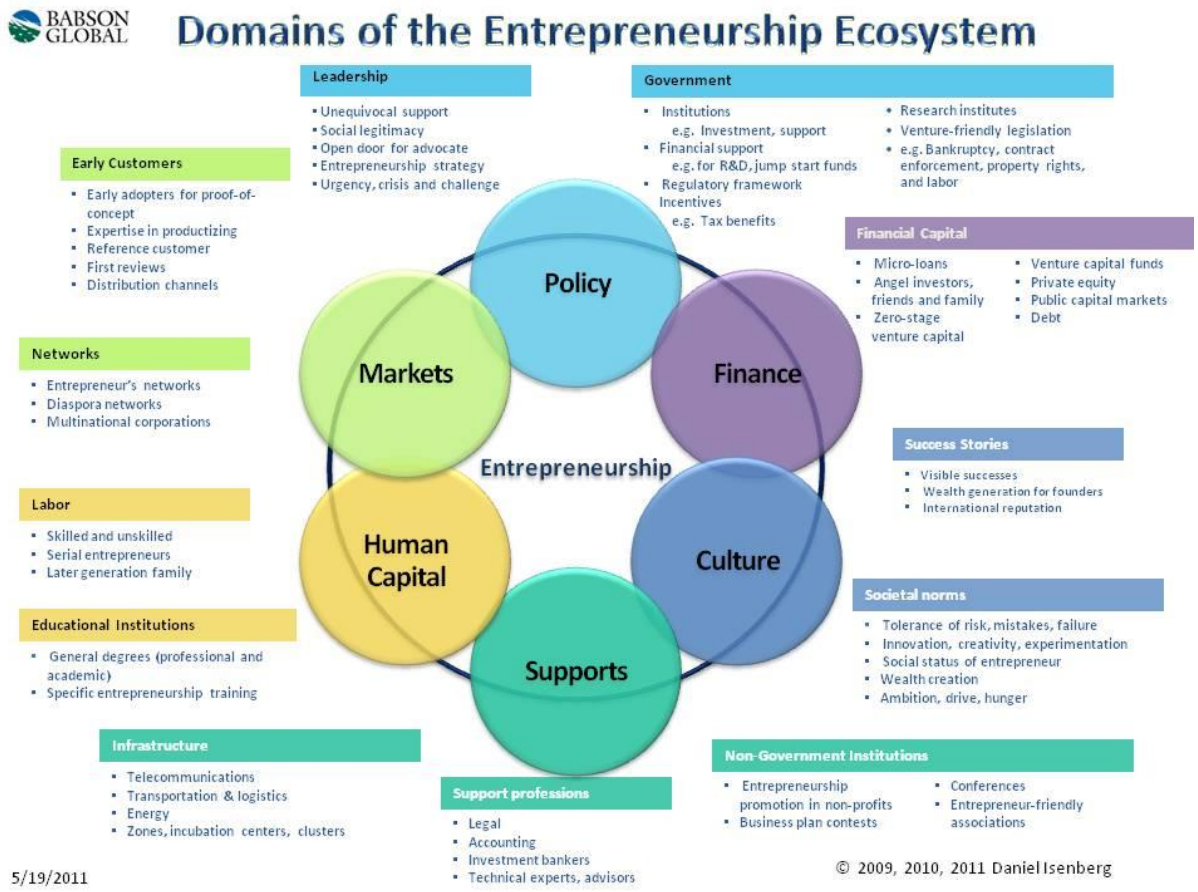

Figure 1. Isenberg's entrepreneurial ecosystem (ibid.)

Representing an entrepreneurial ecosystem through visual diagrams is a widespread practice, and it resonates with the legacy of both cybernetics and system thinking. The model above showcases a process-oriented understanding of an ecosystem in a single, finite system. A hybrid set of actors is thought together in heterogeneous relations, yet devoid of any causal relationships. Plotting these actors together in one diagram acknowledges different sort of actors, both human and non-human, both financial and cultural, taking part in the entrepreneurial ecosystem. Each of the six domains highlighted in Isenberg's diagram, being policy, finance, culture, support, human capital and markets, is divided over several categories, which in turn list subcategories like 'visible successes' (under culture/success stories), 'telecommunications' (under

supports/infrastructures) and 'research institutes' (under policy/government), thereby comfortably placing narratives, technologies, and institutions in one model.

Intriguing about the nine rules of Isenberg's 2010 paper, or the six domains of the ecosystem above, is not the content, which would form an adequate treatment of any amendable economic cluster, it is the ability to enumerate an entrepreneurial ecosystem into traits, categories or guidelines. If an ecosystem is a 'system of organised complex relationships' (after Odum, Odum, & Andrews, 1971), then these lists represent a struggle to summarise a complicated phenomenon, it shows the strife to operationalize the ecosystem through a suitable method. Reporting an economic cluster through ascribed traits helps to make a workable definition which supports detaching from site-specific research to a more general theory. However, by claiming universal applicability, these procedures ignore the cultural and economic tradition from which the framework arose, while portraying little acknowledgement of local specificities in which a new ecosystem will be embedded. An ecosystem cannot be made without explicating the supposed preconditions in advance. Both authors base their models on first-hand experiences and however much the writers want us to believe in their prescription, neither an existing nor an ideal entrepreneurial ecosystem can be exported through engineering schemata.

A recurring theme in the body of entrepreneurial ecosystem studies is that they often focus on case-studies on American soil. A brief empirical research[6] exemplifies the bias towards the United States when talking about starting entrepreneurs in an academic or journalistic context. Simply querying 'startup company'[7] in the academic search engine of the University of Amsterdam [UvA] results in over eleven thousand hits (‘Library of the University of Amsterdam - startup company’, n.d.). This search engine makes huge

[6] This small examination is inspired by the Digital Methods' manner to repurpose search engine results, this school of research will be examined in more detail in the next chapter.

[7] Since the word 'startup' alone is too generic in meaning, the word 'company' is added to make 'startup company', a widely accepted and more neutral term to 'startup' used in this research.

amounts of academic data accessible for quick inspection by indexing books, academic articles, and newspapers of all associated institutions. In addition to a list of search results with the most relevant articles on top, the search engine produces a topic list with the most co-occurring words in the search results. This inventory can be explained as the themes most strongly associated with the term 'startup company' within the search results. Most notably, the list of the top 30 strongest associated words contains both the words 'United States' and its abbreviation 'US' in the respective first and third position while the list has no other geopolitical names included at all (ibid.). The outcome shows it might not be a coincidence most resources directly relate to one sociopolitical system: when writing about startups, one is writing about the United States. Fortunately, the ecosystem paradigm is not limited to US soil for it has been widely adopted in Europe by both research institutes like the World Economic Forum in Davos [in Swiss] and the European Commission sketching future EU policy targets (e.g., 'ePLUS Ecosystem', n.d.).

The third study to discuss is conducted in a collaboration between the World Economic Forum [WEF], the Stanford University, Ernst and Young and Endeavor[8]. Researchers surveyed over a thousand entrepreneurs from all over the world to create a "better understanding how successful entrepreneurial companies accelerate access to new markets and become scalable high-growth businesses" (Drexler, Eltogby, & Foster, 2014, p.4). Rather than relying on experts' opinions and site-specific case-studies, this study is one of the few that relies on a more international body of entrepreneurs. They defined an optimal ecosystem through several components, which are used as variables to benchmark continents and individual countries in multiple 'heat maps'. The eight

[8] The New York based Endeavor works "to catalyze long-term economic growth by selecting, mentoring, and accelerating the best high-impact entrepreneurs worldwide" ('Approach', n.d., n.p.).

components[9] are marked as criteria, as a scale of progress to which entrepreneurial groups are measured on the basis of their location (ibid., p.7). To draw again on system thinking, the WEF has a different strategy to come to a more general and inclusive theory in which the ideal ecosystem has not derived directly from a US based cluster. Though helpful to allow comparison of ecosystems around the world, the downside of this method is its teleological explanation of an ecosystem: merely following the outlined criteria would make the 'ultimate' ecosystem. Also, the heat maps flatten out any differences in the sociopolitical context in which the entrepreneurs operate. Nevertheless, the general report builds on multiple types of research conducted by WEF, of which one deserves further examination.

The presented methods to come to an understanding of what an entrepreneurial ecosystem would consist of each contribute to a particular understanding of an entrepreneurial ecosystem, and are not without their pitfalls. Erik Stam, Dutch professor of economics and high growth firms, argues we have to stop making these 'laundry lists' of pillars, actor and components for they fail to shed light on the nature of dependencies and their inherent temporally bound aspects (2014). Throughout both the US-focussed and the more international-oriented enquiries, there is a recurrent tendency to make lists, and by doing so, an entire phenomenon is reduced to a number of ideas about how we should see an ecosystem and what it should consist of. The WEF even projets what an ideal entrepreneurial ecosystem would look like, to use this perfect model as a liner for existing clusters, reduce them a set of numbers on a bar. This stacking pile of ascribed traits is counterproductive for multiple reasons. First of all, the body of literature on entrepreneurial systems is diverse and without clear definitional consensus. Authors are drawing on a vaguely defined terms to fit their argument, and a new impulse to determine what an ecosystem could mean only

[9] Being: Accessible Markets, Human Capital Workforce, Funding and Finance, Mentors Advisors Support Systems, Regulatory Framework and Infrastructure, Education and Training, Major Universities as Catalysts and Cultural Support.

obfuscates its current ambivalence. A second point, and this cannot be stressed enough, is that the different metaphors inherited from cybernetic and system thinking provide a way to envision the various contributors bound together in heterogeneous relations. Reducing a complexly networked phenomenon to a series of bare categories, instructions or cornerstones fails to properly acknowledge its networked nature. At this point, the early observations by Saxenian (1996) come to mind again. In the foundation of the entrepreneurial ecosystem[10], she urges the necessity to turn to network theory to interpret what was happening when Boston's Route 128 was slowly fading away.

The proposition for this research, informed by Stam's critique and Saxenian's initial observations of economic clusters, is the following: What would happen when 'network theory' as part of the early ecosystem concept is re-formulated into 'network practices' as the core of a methodological enquiry? What would be the added value of a method in which the networked relations of people, institutions and organisations are appropriated as a *means* to understand the ecosystem? The complex networkedness would turn from an asset, used to explain differences between ecosystems, into the driver of an alternative way to imagine an entrepreneurial ecosystem. It would not be represented through somewhat essentialist diagrams derived from one or multiple case-studies, but through an extensive affiliation network, driven by empirical evidence. This epistemological shift requires an alternative approach to a startup ecosystem, in which the relations in a local ecosystem are the main building blocks of the research.

Part of the extensive 2013 WEF report explored the potentials of this transition, a worthwhile interlude before unpacking the proposed methodological shift in more detail. WEF published three case-studies in which the ecosystem of local 'high-growth potential' companies was plotted through their professional network (Drexler et al., 2014, pp. 68-75). The results are based on a 21-year longitudinal study in which over 200 local undertakers were asked the same five standard questions regarding the

[10] A biological metaphor she personally criticized for limitations in its analogy (see Saxenian & others, 1999).

relations they had with other enterprises[11]. The diagram below displays the evolution of the ties between generations of companies included in the Buenos Aires' Entrepreneurial Ecosystem. Each ring serves as a point in time in which the enterprises in question were founded, respectively: 1990-1996; 1997-1999; 2000-2006 and 2007-2011. The node size represents the institutional size (in 2013), and the colourful directional ties are the direct result of the five pre-determined relationship questions.

[11] These questions being: 1) Who inspired you to become an entrepreneur?, 2) Where were you employed before becoming an entrepreneur?, 3) Who invested in your company?, 4) Who mentored you as you built your company?, and 5) Have you founded any additional companies?

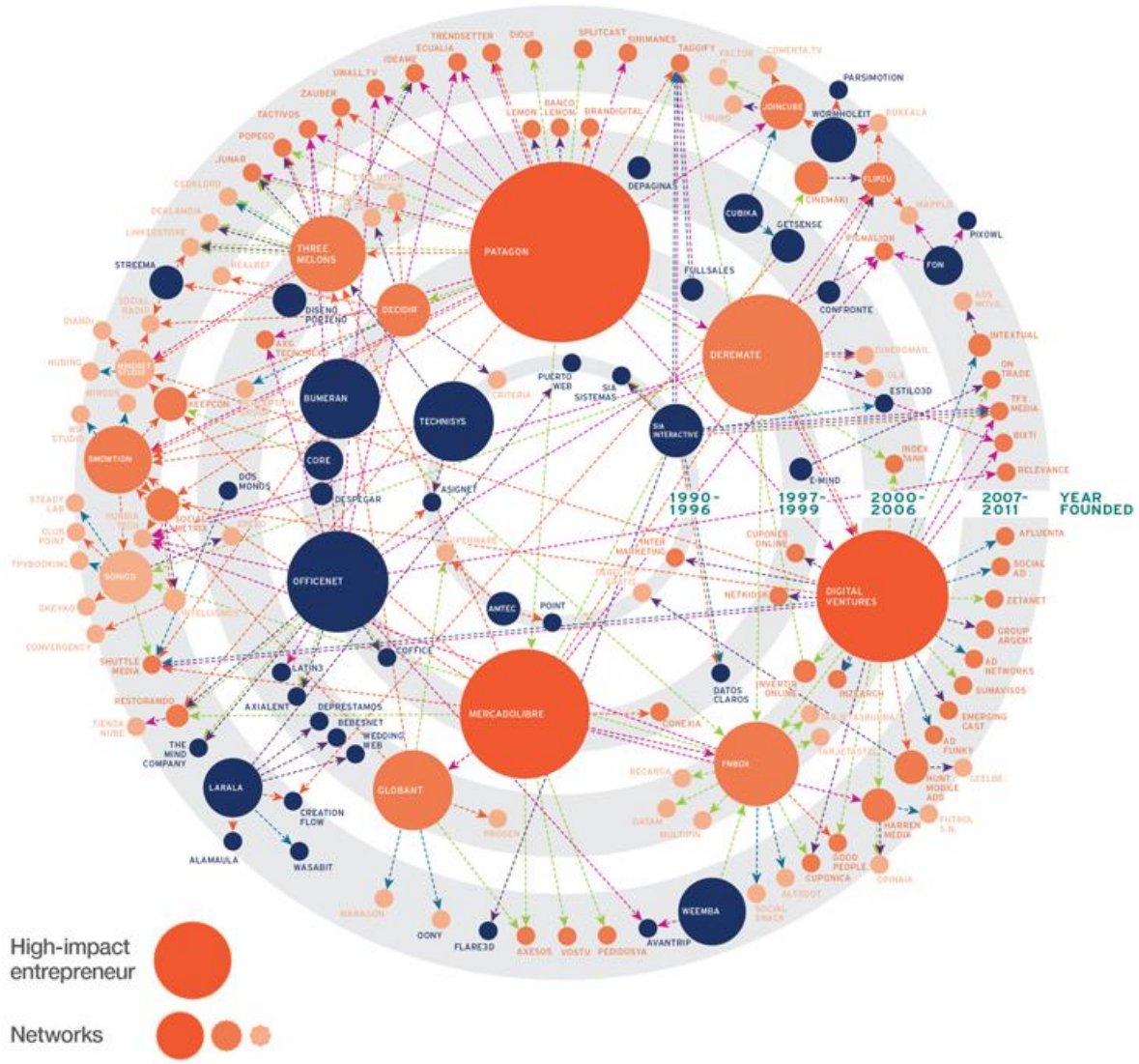

Figure 2. The Buenos Aires Entrepreneurial Ecosystem in relations plotted over time (ibid.).

The step from a 'network theory' induced concept to a 'network practice' driven methodology is beautifully executed here, and this network would formulate an adequate answer to Stam's critique of mutual dependencies and the inevitable temporal aspects any ecosystem has. At the same time, this time-consuming research led to a somewhat simple and iconographic diagram of networked sphere. The ties that bind the nodes together are induced by questions that simultaneously act as a filter, for other

types of relationships are not taken into consideration. As a simple comparison, against the 200 partakers included in this comprehensive research in Buenos Aires, Amsterdam alone has over 700 registered startups part of the local economic cluster ('StartupAmsterdam', n.d.). So, most probably, only a relatively small number of Buenos Aires startups have been included. Also, the included actors consist of entrepreneurs alone, a severe limitation, since startups are entangled in a hybrid mixture of relationships with fellow entrepreneurs, investors, incubators, news agencies, clients et cetera -who together form the ecosystem.

To shortly recapitulate, most ecosystem enquiries have been condemned to have American blinders on. Early ecosystem research has been ignited by peculiar differences in the development of the two US economic clusters, and the United States has been the primary object of scrutiny ever since, by both field experts and scholars. Some models allow for comparing and benchmarking (WEF), others can map and summarise (Isenberg and Feld), yet others produce ideal types (Isenberg and WEF). The drawback is that these methods risk to create more essentialist ideas by generalising what an entrepreneurial system should be with disregard for the differences in the local sociopolitical context. A second problem is that, while the paradigm was initially built on network theory, the network has slowly been substituted by a categorical understanding which only allows limited exposure of how local players tie together. In other words, it gives too little insight into the networked mechanisms at work between actors in the system.

With the rise of the social web however, a new field of internet research emerged, not dependent on individual polling, but drawing on increasing online communication. Since early explorations of the Global Business Network and the introduction of collaborative networked platforms like the WELL, internet in general, and the networked forms of organisation in particular, became more ubiquitous. Network entrepreneurs and other organisations and institutions are now tightly knitted together, with their communication spread over many media channels. These media empower

alternative communities, a group of people linked together through their social interaction online, through the affordance of particular forms of communication and self-branding. Over the last years, a branch of internet researchers involved in 'digital methods' is devoted to repurposing digital media for their research aspirations, thereby contributing to the field of internet research (Rogers, 2013), which will be discussed in more detail in the next chapter. Social media platforms now evoke large volumes of user-generated information often publicly available, which can be used for social research (ibid.) Social media can be repurposed to look at the local characteristics of an ecosystem based on the mediated communication of its participants, which at the same time supports the move away from the idea of reproducibility or teleological storytelling incorporated in some conventional ecosystem analyses. A Twitter-driven method can help to map the local ecosystem as seen through the eyes of the entrepreneurs, and therefore this alternative method supports the switch from network theory as a conceptual framework to networked practices as the central point of the methodology.

A digital methods injected mixed-method will be employed to look at connectedness and positioning of a specific group of entrepreneurs in the Dutch startup ecosystem. The following section will motivate the focus on the Dutch entrepreneurial ecosystem by looking into what makes the Dutch context an interesting field of enquiry, followed by an operationalization of the subgroup of entrepreneurs of special interest: social startups.

The Dutch entrepreneurs' climate is an interesting case-study, as the Dutch government has done a great amount of work to make life easier for starting companies through tax breaks, policy deregulation and the alleviation of the administrative burdens (Stam, 2014). Although invoked to stimulate a more innovative economy in times of change, the measures did not have the desired effect in nurturing the most innovative startups. Instead, The Netherlands has seen a severe rise of so-called solo self-employed entrepreneurs [zzp-ers in Dutch], and these entrepreneurs have only a small chance of

transforming into the innovative and scalable companies aimed for (ibid.). It is not to say that innovative parties are absent in the entrepreneurial scene, but they need severe tracking to make them visible. Therefore, this research will zoom in on the most innovative and vulnerable young companies, social startups, to look at the workings of the Dutch ecosystem on ground level. To properly boil down to a workable definition of 'social startup', allow an elaboration on the roots of the term, a combination of the words 'social entrepreneur' and 'startup company'.

The social entrepreneur is a notion coined by Leadbeater (1997) who observed a new form of entrepreneurship in the late nineties United Kingdom. The social entrepreneur helps to meet the growing social needs -partly due to slow deregulation of the welfare state- outside traditional institutions, which are often seen as inefficient, ineffective and unresponsive (Dees & others, 1998). Slowly climbing out of the former binary position of the subsidised social sector and commercial for-profit parties, the social entrepreneur combines its passion for a social mission with business-like practices (ibid.). In other words, the entrepreneurial mindset can turn social problems into business opportunities. For the social entrepreneur, impact comes before profit and revenue should primarily be seen as a means to a social end. Besides, the enterprise should be transparent, based on equality and fairness to everyone, and take notice of its ecological footprint (‘Social Enterprise NL :: Definitie’, n.d.). However, an organisation coaching youth to explore their talents is not build to grow fast, nor is local community initiative like a donation-café intended to scale to a multinational corporate. Then what makes a social enterprise a startup?

The American Business journal Forbes published a small but comprehensive article explaining what a startup could mean. Descriptions from experts in the field range from 'a state of mind' to 'the decision to forgo stability for tremendous growth potential' (‘What Is A Startup? - Forbes’, n.d.). Some attempted a negative definition by sketching the criteria that would make a startup outgrow its life phase, and others hooked on to the supposed technological nature of its products. Most poetically, startups could be a

"finger on the pulse of the future" (ibid). Paul Graham, venture capitalist and co-founder of the oldest incubator Y-Combinator highlights one of its most essential and recurring features: growth, or rather, exponential growth (Graham, 2012). He argues growth can be considered the compass for every decision made in a startup's life (ibid.). Since statistically half of all startups go bankrupt within four years and seven out of ten will not survive the decade, more than an aim in itself, growth is a necessity in the constant struggle to stay alive. More than anything, startups embody an imagined growth potential (ibid.), and their devotion to growing is actively sold to give access to the right financial and non-financial means. Any investor, mentor or even an employee will only contribute to the startup's development if one believes in its future.

Would the 'startup' definition be compatible with the 'social enterprise' criteria? Integrating the two definitions leads to an understanding quite narrowed down in its scope. A 'social startup' would prioritise the quest for social impact while retaining startup characteristics regarding scalability and growth. But since scalability and growth are usually explained through revenue rather than impact, a social startup would be a contradiction in termini in traditional business models. The most innovative group is most prone to failure because they will fail to deliver the criteria of regular startups that have return-on-investment up front. This 'weak spot' in economic terms, together with the lack of an appropriate legal framework[12,] makes social startups more dependent on their support network to grow, which provokes the question to what extent the Dutch startup ecosystem facilitates the right growth conditions for social

[12] Thanks to early recognition of its economic and social importance, England was quick to formalise and institutionalise social entrepreneurs' legal status. They now have the most extensive financial and legal framework available for their social enterprises. Other countries took more time acknowledge and integrate a separate status for companies with newly emerging business models. In 1991, Italy was the first country to incorporate a legal form adjusted to the needs of social entrepreneurs, thereby recognizing the existence of businesses with primarily social objectives. In France, social enterprises have been politically recognised since the ruling of president Hollandes in 2012 ('Social Enterprise NL :: Buitenland', n.d.). Unfortunately, The Netherlands offers no separate legal form to undertakers focussed on social impact ('Social Enterprise NL :: Nederland', n.d.).

startups. In turn, it makes them a viable source of information when enquiring in the mechanisms of the Dutch entrepreneurial ecosystem.

The following chapter will operationalize the methodology used within this research by starting with the introduction of the actor-network theory. This theory will allow the integration of tweets, interview data and networked representations of the ecosystem into one interpretative framework. The specific technological tools to scrape, analyse and visualise the data are obtained through an internet research group in which this project is rooted called Digital Methods Initiative. After explaining the recursive process of data collection, interviews and the crafting of hypothesis, the chapter will come to a list of 10 Dutch social startups, the result of a triangulation of two databases; these names will be used to highlight their position in the entire network in a later stage.

II. To DETECT, DISCOVER and DETERMINE

Whereas more descriptive ethnographic methods allow for richer data to be gathered in all its ambiguity and incongruence on the individual level -they tend to focus exclusively on a few locations. On the other side of the spectrum, one finds a set of mostly commercial platforms who, through the act of gathering, indexing, and aggregating quantitative data, claim to portray at least the majority of actors involved a specific field. The first will be able to explain relations between the participants in small networks without an overview; the latter can only consolidate groups based on indexed categories like industries, revenue model or other variables without any form of explanation. To overcome the disadvantages of either of these two techniques, the Actor-Network Theory [ANT] will help to create an overarching interpretative framework which integrates the two methods. ANT facilitates the tracing of social startups through Twitter and tweets, and through interviews and networks, because within actor-network theory, the researcher 'follows' the actor over a heterogeneous network of both human and non-human actors. Such an integrative methodology is

useful to scrutinise the agency that lies in the entrepreneurs, the media used, and the various ways in which the ecosystem is represented. ‘Following' requires a particular sensitivity of the researcher to be guided by its research subjects through the assemblage from which meaning derives (Latour, 2005) -an ecosystem in this case. The verb 'to trace' is used to mark that the researcher is subjected to guidance and because the word implies the process of selecting, exemplifying, and rendering, it acknowledges the investigator's active contribution by accentuating certain aspects of the ecosystem.

The Actor-Network Theory is not undisputed either. In the first place, it is criticized for its 'tracing' abilities in questions over agency. The role of the individual researcher is interrogated by asking the rhetorical question 'who is following'. Reversing the research subject and object shows a researcher is prone to tracing their own presuppositions rather than the perspective of the research subject (Heeks & Seo-Zindy, 2013). A second critique is formulated around the problem of scope and delimitation of the research. Starting with an open and non-delineated framework, the researcher might end up with a long descriptive text with limited analytical value. As noted by Sorensen and Levold (1992), in the ambiguity of 'what to trace', the researcher might get lost between different possible narratives. Within this research, these two difficulties are recognised and taken into account through two distinct strategies. To be guided rather than actively following, a 'naive' mode of questioning will help to test preliminary results rather than the researcher's assumptions. Also, the researcher should consider himself as a research instrument in need of constant evaluation of its validity and neutrality. To employ a productive analytical outcome of all possible narratives, the actors that need following only consist of a small and well-defined group.

As mentioned earlier, this research partly draws on methodological practices developed by the Digital Methods Initiative [DMI], an Internet Studies research group at the University of Amsterdam that closely resonates with Actor-Network Theory. These scholars produce both a larger argument on the epistemological value of internet research for social scientists, together with the practical tools to repurpose digital

media for social research goals. Concerning the process of re-appropriation, Rogers asks himself the question how "digital objects [may] be combined and recombined in ways that are useful not so much for searching Twitter, but rather for social and cultural research questions?" (Rogers, 2013, p. 1). How can we move beyond Twitter as a microblogging platform and use the characteristics of both the platform and the tweet for social research? A tweet has multiple attributes which, as far as the API[13] allows, can be used as criteria to select and filter information at the start of a new data collection. Aggregated tweets can be used for other purposes than the front-end Twitter interface allows, like content- or network-analysis which is useful for an alternative ecosystem approach. The right criteria by which tweets will be scraped are crucial to explain the results of the subsequent analysis. In the case of this research, the Twitter accounts of Dutch startups will be selected through the use of an expert list. Usually, an expert list is a list of entries created by preferably an expert institution, often not aimed at its completeness or inclusion but at the conciseness and validity of every input. For a researcher, the expert list can be seen as an entry point to the field of digital research. To get a sub-selection of social startups active on Twitter, the curated membership list of Social Enterprise NL will be triangulated with the user-generated database of Dutch startups made available by Dealroom.

As a convenient starting point, the Dutch data-farm Dealroom provided a list with the details of 1000 Netherlands-based startups in their 'growth' or 'early seed' phase. Dealroom is "a data-driven marketplace for venture capital" which collects information on the startups from various user-generated sources (‘Dealroom.co – Europe’s go-to website to discover new tech companies and connect with the right investors.’, n.d.). Their database includes information on the startups' name, location, stage of growth, the amount of injected capital and, if available, the names of the investing parties. Besides demographic information, the table shows links to the company's' website,

[13] The Advanced Program Interface, which is a backdoor to a platform for third parties to ask for available data without using the front-end web interface.

Facebook page, and Twitter profile if applicable. It is a useful source of information since over 70 percent of all recorded startup entries have a Twitter account in which most of their communication is openly available. Besides, the spreadsheet Dealroom shared contains the information of over 60 percent of the Dutch startups which makes the list both elaborate and inclusive. The last benefit of using this expert list is the fact that it delimits and solidifies the body of research subjects. Although there is no hard definition for companies to appear in the user-generated list[14], it eliminates the consideration of individual companies to be included in the research.

The DMI developed the Twitter Capture and Analysis Toolset [TCAT], a tool which can scrape large quantities of tweets based on a search query or a list of user accounts (Borra & Rieder, 2014). TCAT has a list of default analytical variables available for direct export including 'tweet statistics and activity metrics', 'tweet export' or 'network files', of which the latter can later be opened in a graphical network tool. The open-source program Gephi will be used to visually explore the networked data with a set of algorithms commonly used in social network analysis, most notably ForceAtlas2 (Bastian, Heymann, Jacomy, & others, 2009; Jacomy, Venturini, Heymann, & Bastian, 2014). Plotting the data into a visual network graph makes it easier to explore the clusters and social ties of particular actors. The TCAT tool will scrape up to 3200[15] tweets sent by any one of the 598 Dutch startup Twitter accounts included in the Dealroom list. In contrast with the WEF longitudinal network analysis, the TCAT tool can export a 'mention network', which incorporates all other Twitter accounts cited by any of the Dutch startups in the list. Moreover, the set will be large enough to speak for the entire Dutch startup scene: the 598 Twitter users represent over 37 percent of all

[14] It needs to be noticed that the database contains some noise. The fact that the data is gathered without one coherent consensus on the criteria for selection and is the result of an aggregation of other user-generated databases like Techcrunch and Angellist explains why some Dutch startups entries are quite old, or not primarily based in the Netherlands. However, without actively filtering this companies, the outliers are not present in later network analysis due to the lack of Twitter activity with (other) Dutch startups.

[15] Twitter's 'advanced program interface' [API] is the 'backdoor' to Twitter which allows for automatic data scraping. This API has an inherent limit of scraping up to 3200 tweets per account.

Dutch Dealroom registered startups -which equals an estimated 50 percent of all registered startups active on Twitter.

Nevertheless, significant results do not imply that the analysis is straightforward, and when working with a dataset of over 400.000 tweets, one has to be wary that the data is never self-explanatory. In her insightful work *Raw data is an Oxymoron*, NYU professor of media, culture and communication Lisa Gitelman states that data "need to be understood as framed and framing, understood, that is, according to the uses to which they are and can be put" (Gitelman, 2013, p. 5). Or, after Lev Manovich, data do not just exist, but they are actively generated (2011). Consequently, no such thing like purely data-driven[16] research exists; data always needs closer scrutiny in the context of both its production and its analysis. Therefore, DMI coordinator Esther Weltevrede proposes a device-driven approach, which explicitly incorporates the apparatus of production, retrieval, and analysis (Weltevrede & others, 2016). In a practical sense, she urges to question the research affordances of the devices or platforms in which the data is produced as an essential part of the methodology. During interpretation and interrogation of research findings, the platform specificity needs to be taken into account since any platform, she argues, "deals with the relation between objective, medium and method, which are specific to the actors and the context of use" (p. 12). Consequently, interpreting the results requires active reflection on the role Twitter has in the creation of a tweet to deepen the understanding of both the platform used and the affordances that helped shape the data[17].

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[16] Although in some data-driven research is argued significant correlations do not need a supporting hypothesis to be true, for more information on the discussion on epistemological questions of big data, see for instance Kitchin, 2014; Gitelman, 2013; Kelling et al., 2009 or Miller, 2010.

[17] An example of investigation would be to say Twitter facilitates particular forms of interaction while limiting others. While messages will appear in the timeline of followers, a tweet can only be directed selected group of users for one can only tag a few names in one message when one encounters the 140-character limit. In turn, the impossibility to do so has severe implications for cluster density when analysing a conversation. Another example is that Twitter, being predominantly a public medium, will

Needless to say, the messages published on Twitter by no means exhibit all social ties an enterprise has to other actors in the ecosystem. A Twitter analysis will help to explore the connectedness and clustering of a complex network, but it will need additional sources of information to grasp the meaning the various relations have. To be able to understand the mechanism of a networked ecosystem at work, one needs to constantly shift between macro, meso, and micro levels of analysis. Therefore, a series of interviews will be conducted with both social startups and other organisations critical to their configuration and integration in the network, to explore their personal perspective on the most relevant actors that contributed to their growth. Twitter could arguably qualify as an emic perspective, a perspective from within (after Harris, 1979), based on the fact that the information is created from the subjects' point of view. However, Twitter does not capture the nature of the relation between the users. In addition, many tweets are published with a specific audience in mind (Marwick & others, 2011), which makes a Twitter-based analysis a poor tool to get exploratory insights in individual cases. Therefore, semi-structured interviews with open-ended questions are a welcome contribution to include a narrated bottom-up perspective. The interviewee selection process will be informed by the network analysis, to generate a list of the social startups and five other organisations that appear to be important to their organisation and integration in the entire system. Although not as statistically relevant as the network analysis, interviews will, on the one hand, provide help to triangulate and validate the network analysis, while on the other hand enrich in-depth insights to support and deepen the understanding of the ties that connect them together.

The cornerstone of any qualitative methodology is based on finding and asking the right question. Interview questions will be formulated while consulting the network analysis

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skew results towards relations that are public by nature. It is likely that the companies' community management and public relations would be more visible than more privately communication like acquisition and talking to an investor or mentor. A last illustration can be made by looking at the central list of Twitter accounts. Since they represent companies rather than persons, their ties will be different from the connections that might be found through the founders' Twitter profile.

so that the interviews focus on the orientation of the actor -may it concern a person, institute, startup or other partakers. The fact that the group of social startups is only a small subset will permit asking open-ended questions regarding its position, ties, and missing connections. Rather than being restricted to a series of standard questions asked to every actor -as is the case in the Buenos Aires study by the World Economic Forum- questions will evolve over time, accompanied by hypotheses in constant evolution at the back-end of the research. An interview does not start from scratch because early results on the network analysis will inform the interviewer, and despite the possibility that this information may bias the conversation, it can also be used strategically as an interview technique. One way to prevent the bias to happen is to actively switch to a 'naive' mode, in which the interviewer ask questions of which a supposed answer has already derived from the network analysis. It will help to triangulate results while staying open for an alternative explanation (DeWalt & DeWalt, 2010). In a second naive strategy, the interviewer might confront the interviewee with the data gathered online to ask for their interpretation, a technique that turned out very useful as will be discussed in the next chapter. The naive mode is particularly helpful to strengthen the validity of the research, gain insight into limitations and things that might have been overlooked, and finally, to triangulate for possible contradictions in the data.

Every interview will be transcribed immediately after the conversation took place based on jots made during the interview. This shortens the time needed to process the qualitative data and provides a filter to select the on-topic information only. In practice, it does require the sensitivity to notice potentially relevant non-verbal information that needs annotating. The translation from interview information to hypotheses will not depend on the coding of individual interviews. Instead, 'memos', which are a “specialised type of written records [...] that contain the products of [the] analyses” (Corbin & Strauss, 2014), will help to formulate topics into hypotheses throughout the continuous process of interviewing and reflecting. Organising the memos leads to the formulation of new hypotheses which the interviewer will be able to test during the

next interview. Notice that the different stages of the research do not represent a linear process; the output of one mode of data gathering might inform the input of another, turning the stages into recursive steps. It might turn out to be convenient to critically examine the Twitter network analysis again in between interviews before making the next hypothesis. Likewise, a new hypothesis might shed a different light on the information gathered in earlier interviews.

Before discussing the results, one more methodological step needs to be taken. With the list of over 500 Twitter accounts of starting enterprises in the Dealroom database, we still need to drill down to the ones of special interest, to create the expert list which will be used to trace the social startups. In the next section, the membership list of Social Enterprise NL will be triangulated with the Dealroom database export to end up with ten social startups which will form the outset of this research.

The Dutch organisation for social enterprises, Social Enterprise NL [SEnl] offers a list of the names of their 261 members on their website (http://www.social-enterprise.nl/wie-doen-het/). This page with the member profiles needs to be triangulated with the Dealroom list of startups to get to the 'social startups' we are looking for. Startup names are a poor criterion to use for comparison, since their exact spellings may vary between lists (with or without space [ ], with or without legal form included, using [&], [en] or [and], et cetera) -and checking a list of 598 entries manually is laborious. The safest choice for comparison is the URL of the website stripped of its opening (http://www. and derivatives) and its closing (.nl, .com et cetera) because the 'heart' will always be the same. But how to collect the websites of over 250 social enterprises?

The first step would be to scrape all internal links of the SEnl page listing their members to end up with a list of individual profile pages, for instance, http://www.social-enterprise.nl/wie-doen-het/yumeko/ for Yumeko and http://www.social-enterprise.nl/wie-doen-het/konnektid/ for Konnektid. The Link Ripper ('Link Ripper', n.d.), developed by DMI, can scrape internal or outgoing hyperlinks of a given webpage

(URL). Solely scraping the URL with the overview of their members for internal links results in a list referring to the local SEnl profile pages on which the enterprise's website is mentioned. In the next step, the Link Ripper can be used again, this time, to scrape all outlinks from the list of profile URLs obtained in the last scrape. Removing the start and end of the entrepreneurs' websites is done using OpenRefine ('OpenRefine', n.d.) by splitting the columns by [.]. Now, one column will display a list with only the 'heart' of the enterprise's URL. Repeating the last step with the list of websites from the Dealroom list resulted in two lists with clean data. For triangulation purposes the DMI Triangulate tool was used ('Triangulate', n.d.), resulting in ten names of companies that occur in both lists. This does not mean that the Dealroom database only includes ten organisations that are considered social entrepreneurs, it means it only has ten entries that are also a member of SEnl. As a comparison, the Netherlands has an estimated 4000 social entrepreneurs (Verloop, Van Dijk, Carsouw, & Van der Molen, 2011) of which only 261 are registered at SEnl. Nevertheless, nine out of ten social startups (WeGo mobility is excluded, see the footnote below) will appear on the expert list used to trace social startups in the entire ecosystem.

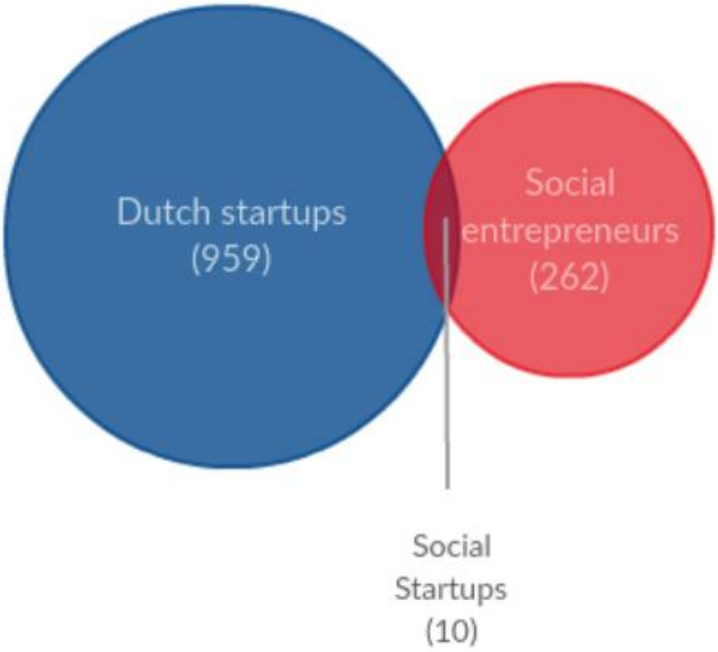

Figure 3. A Venn diagram explaining the triangulation of lists.

Name	**Website**	**Twitter account**
Bundles	https://www.bundles.nl/#!lang=en	@wasbundles
Fairphone	https://www.fairphone.com/	@fairphone
Heppee	http://www.heppee.com/	@heppeeapp
Konnektid	https://www.konnektid.com/	@konnektid
Part-up	https://part-up.com/	@partupcom
vandebron	https://vandebron.nl/#!/	@vandebron
Waka-Waka	http://nl.waka-waka.com/	@wakawakalight

WeGo[18]	http://www.wego.nu/	@wego_mobility
Yournalism	http://yournalism.nl/en/	@yournalismnl
Snappcar	http://snappcar.nl	@snappcar

This methodological section showed how actor-network theory will allow us to follow several actors throughout different human and non-human elements of the network, ANT being the overarching interpretative framework, later triangulated with data from naive interview techniques.. The Digital Methods Initiative provided the tools and the epistemological ground in which this research is rooted, and subsequently, two expert lists have been operationalized to start gathering and analysing Twitter and interview data. The first list contains the user accounts of almost 600 Dutch startups, used as the starting point for a Twitter scrape. The collection of tweets will be used to plot the affiliation network of Dutch startups, which can be considered as the ecosystem seen through the eyes of the startups. The second expert list, printed above, is the result the triangulation of the Dealroom and Social Enterprise NL data. Now the expert list of social startups has been boiled down, it can be used to trace their position in the larger network of actors.

The following chapter presents the results built around the broader methodological argument of this thesis. It will start with a general outline of the affiliation network of Dutch startups based on their communication on Twitter, to subsequently trace the position of the actors above in the entire network. Next, interviews will help to shift from the exploratory to the explanatory mode, to afterwards discuss the potential

[18] Wego Mobility is the only company that did not qualify to be in this list since, after a short phone call, WeGo Mobility informed that it did not exist as a consumer product anymore, and it did not consider itself as a social enterprise. Instead, it grew to a technical business2business service platform for car sharing. In combination with the fact that they have been mentioned very little, they have been excluded from further analysis. Within this list, they are the only 'false positive'.

problems one might run into when working with the networked representations of an ecosystem in an interview setting. Additionally, five other actors that are important organisers for the dominant social startup cluster in the field are highlighted. But first, it will start off with the practical question on how to manage and work with the large amount of tweets captured for this research.

III. INTRODUCING THE NETWORK

Scraping up to about 3200[19] tweets of individual Twitter accounts resulted in a collection of 474.613 tweets in which the oldest tweet was published in 2007. The TCAT interface quickly gives insights into the timeframe of the dataset in question: the distribution of the dates by which the tweets are published shows that the majority is less than five years old. This might be explained by the fact Twitter was founded in 2006 and grew in importance over the last decade. Another explanation is that that a 'startup' only represents a temporary state in the circle of business life, some will just outgrow this position, and the majority will not survive this stage at all. Nevertheless, the choice to take 598 startup Twitter accounts as a limitation without narrowing down to a specific timespan has some implications for the graphs that are being presented throughout this paper. In consultation of the argument, an ecosystem is always in a temporary state (after Stam 2014), the downside of the larger time frame is that the networks presented in this chapter might not have existed at any point in time since it represents the relations aggregated over the years. The tweets collected for analysis have not been selected by their date of publication to give a more stabilised picture of the Dutch startup ecosystem, rather than portraying a network that captures a moment.

[19] In case of the 598 accounts scraped in this research, 53 accounts had more published tweets than could be scraped, in this case the API would only scrape the newest tweets. In other words, due to technical limitations, the top 9 percent of the included accounts have been throttled in their attribution to the dataset. Consequently, the graph has been less biased towards to top 10 percent.

Affiliation networks will change from day to day, and since startups are quite time-constrained in their existence, any given 'timeframe' will have an innate bias[20].

TCAT has several options to export the Twitter dataset as a network file, which can be opened with visual network analysis software like Gephi. Just walking through the process of importing the 'social graph by mentions'[21] file in Gephi tells the entire ecosystem includes 119.756 nodes, which means the 598 startup accounts have interacted with 119.000 unique users in their tweets. Just by itself, this number is quite meaningless, so to start making sense of the network, we will begin with a visual exploration of the network in Gephi.

[20] It needs mentioning that the data collection can be used to show how the ecosystem evolves over time. Mapping such an evolutionary system, more closely related to the WEF 'trans-generational' network analysis could be a suggestion for future research.

[21] As described in the TCAT manual, this graph can be used to "analyse patterns in communication, find 'hubs' and 'communities' [and] categorise user accounts".

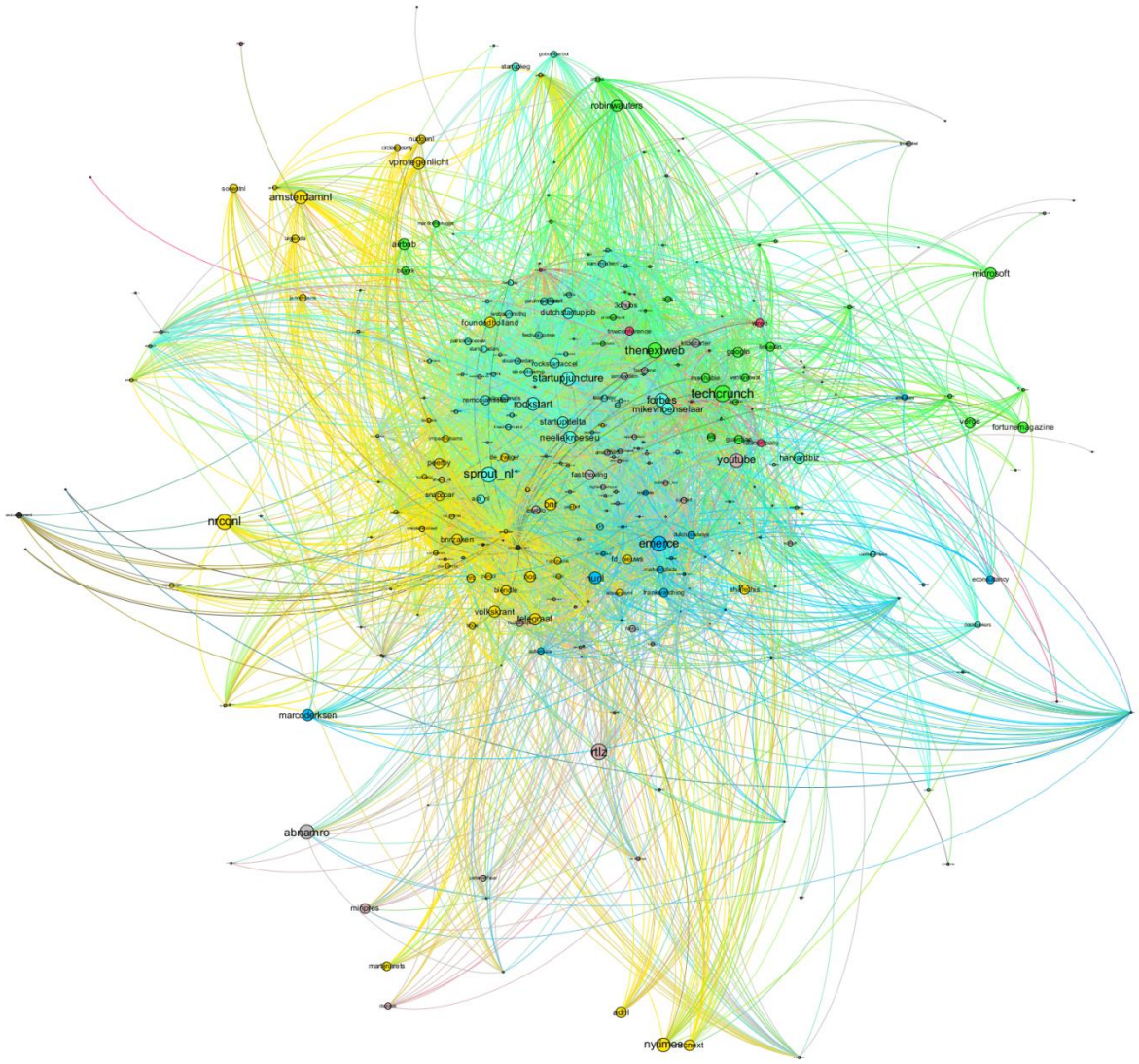

Figure 4. The first graph shows the 'connectedness' of the ecosystem.

The network graph above can be read as follows: every node [dot] represents a Twitter user account. If one user mentions another, this creates an edge [a link] between the two nodes. The more interaction between the two accounts, the stronger the traction between the nodes. The node size represents the number of times an actor is mentioned in the collection of tweets. Another explanation would be to say that the bigger the node size, the more authority the actor in question has or the more they are in the picture. A

third visual variable is the colour of the nodes and edges. A modularity algorithm helped to visualise the statistical communities present in the data, and every significant community got its own colour; these communities represent actors that are heavily interlinked. The graph shows a densely connected network with no particular visual clusters to be distinguished. The centre is formed by a sphere of actors while the outside periphery contains some outliers only loosely attached to the dominant network. The use of Forceatlas2 together with the LinLog mode partly explains the seemingly sharp distinction between the inner globe and the outer sphere, for these visual algorithms intensify the networked characteristics of the ecosystem. In the next graph, the network enjoys a bit more space without the LinLog algorithm amplifying the connectedness. Since actors are not compressed into one sphere, it pictures a more nuanced and spread field. Notice that, while this network includes the same actors and relations as before, the modularity algorithm has ascribed different colours to the statistical communities.

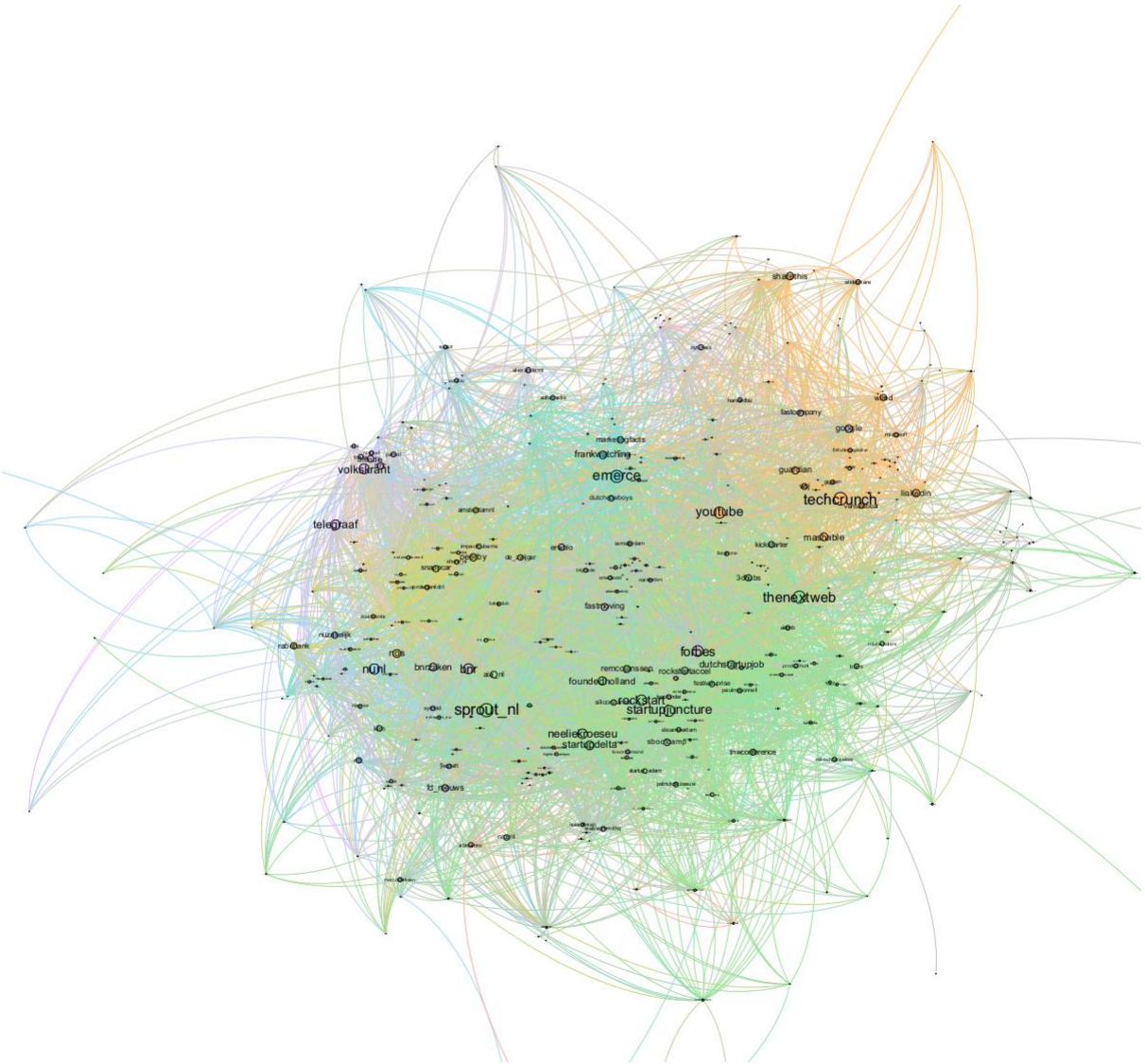

Figure 5. The second plot portrays the spread of the network.

This representation does more justice to the mutual relations the actors have; it shows that while the network is densely connected, there is no strict separation between an inner and outer sphere. The nodes in this network are unevenly spread, which points towards early cluster formation with one larger dominant group (green) and multiple smaller groups with each its own place (green, blue, purple, reddish and sand colour). In this graph, some areas are more crowded where other parts are less densely populated,

illustrating some centres of gravity. Just like the first graph, it includes the top 365 most mentioned actors, which is not an arbitrary number. Every Twitter account included in the graphs is mentioned at least 89 times by any of the Dutch startups, and increasing this number would start to exclude one or more of the nine social startups on the expert list. Now, allow the introduction of the last graph in the exploration of the network. This time, the LinLog mode is used again but with even more space to plot. In addition, the following graph includes the top 500 most mentioned actors rather than the top 365 to give more ‘flesh' to the clustering algorithm.

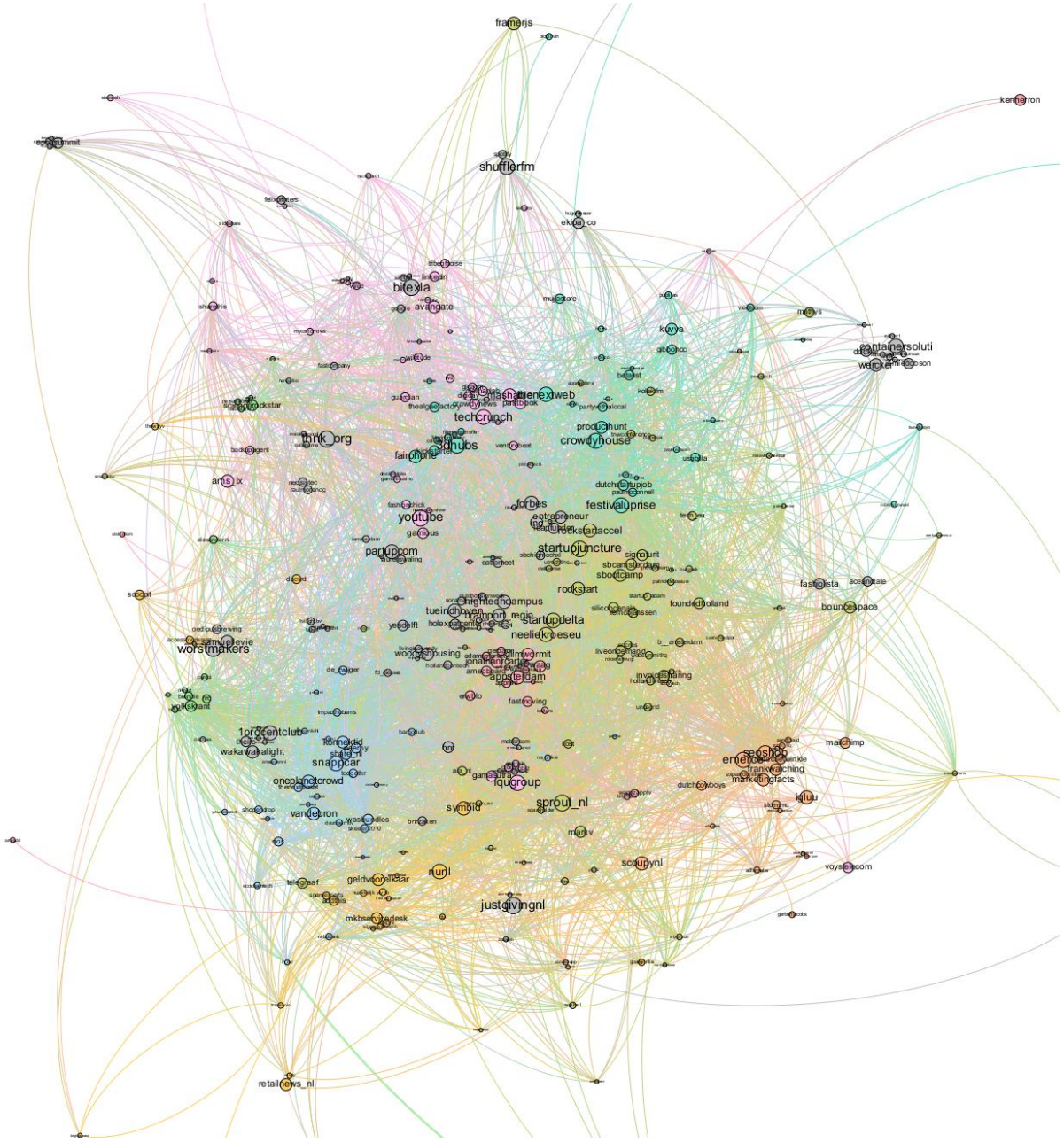

Figure 6. The third render helps to explore the clusters in the network.

Again, we see a different representation of the same ecosystem. This network shows that, although the network is densely connected (as is confirmed by the first render), there are smaller groups and communities that are more closely associated. Besides,

some more centralised groups are more integrated into the entire ecosystem, where some groups are quite isolated, for instance, the community of IT-infrastructure related startups in the top right corner. This community-based representation will be explored in more detail in the next chapter.

To shortly recapitulate, the database with over 470k tweets of almost 600 Dutch startups has been exported into a mention network. The network contains 119.000 mentioned Twitter users of which only the top 365 to 500 most mentioned parties were selected for further analysis. All nodes represented in the graphs are mentioned at least 89 times because this is the highest filtering possible without excluding one of the core social startups. In a more descriptive manner, the first graph depicts the top mentioned actors as quite strongly connected; there are no specific isolated clusters to be found anywhere. The second graph shows that, although the network is highly connected, there is some form of clustering to be found in which one dominant group of smaller more interconnected actors take part. The third graph sketches the clusters that are present, about twelve or thirteen distinct groups. These three representations of the same network are entirely different in their layout and implications, and they are predominantly chosen for the unique angles in which they portray the network.

What are the implications of working with multiple representations of the same ecosystem? First of all, we have to take into account that the graphs above are each just one of the possible representations of the network, and therefore the graphs should not be thought of in finalised terms[22]. Any graph is the result of another exploration of the data, and exploring its behaviour with different variables makes for a better understanding. Perhaps the visuals represented above can be understood as the stills of

[22] Writing on the enchanted potentials of technologies, McCarthy and Wright observe an insight which can as well be applied to the visually attractive networks presented in this research. They build on philosopher and literary scholar Bakhtin to position themselves against the world of 'finalised minds' (Bakhtin, 2010) which would leave little room for serendipity, messiness, and unexpected discoveries: "We have closed our minds off to the potentiality of the physical, biological and social world, having already decided what everything is instead of looking closely" (McCarthy & Wright, 2003, p. 83).

a film, as one frame of a network which is always on the move. A second implication of working with various representations of one network is that, while playing with the filter and visual algorithm settings, one risks spending days exploring the network until it reaches a point of saturation. These wanderings can lead to a better understanding of the complexity of the system, but one might eventually get lost in various representations of the Twitter-driven network asking oneself questions like 'which graphs should I choose' or 'which graphs makes most sense'? Thirdly, any of the presented graphs should be understood as a struggle over visibility and readability. Including all 119.000 mentioned user accounts in a visual analysis would mainly result in a network unreadable on whatever screen, and it would take a long time to process. Drawing on *Understanding Comics* by comic theorist Scott McCloud (1993), Mathieu Jacomy (2016) explains the 'readability versus details' problem with several illustrations of faces. They form a spectrum with on the left side a detailed picture of a man with an expressive face and on the right side a simple, neutral smiley. The latter is easier to read, but imprecise and incomplete compared to the left picture. To make a visualisation comprehensible, one needs to carefully filter the information without being too reductionist so as not to lose valuable details. A further increase of the 'mention filter' would make the graph more readable, but omits essential details of some of the social startups in the expert list.

Still, the graphs do not tell anything about the reason why some actors are more closely affiliated while others are floating in between various groups. We need to slowly zoom in -changing from macro to meso and micro level of analysis- to include other points of view to support the shift from the exploratory overview to the explanatory detail. Where many of the entrepreneurial ecosystem diagrams discussed in the introduction explain the ecosystem from one perspective -often the macro level-, this approach will include additional emic perspectives to be able to explain what we see in the Twitter-driven network. In the first step of tracing the social startups in the entire network, they will be made visible in the network to unveil their position and their mutual relations. This can be accomplished by simply highlighting the names of their Twitter accounts in

the maps presented above to answer questions like: Are they clustered or spread? Are they more centralised or positioned in the periphery? And of course, it needs to be seen whether one could talk about the 'social startups' as one group.

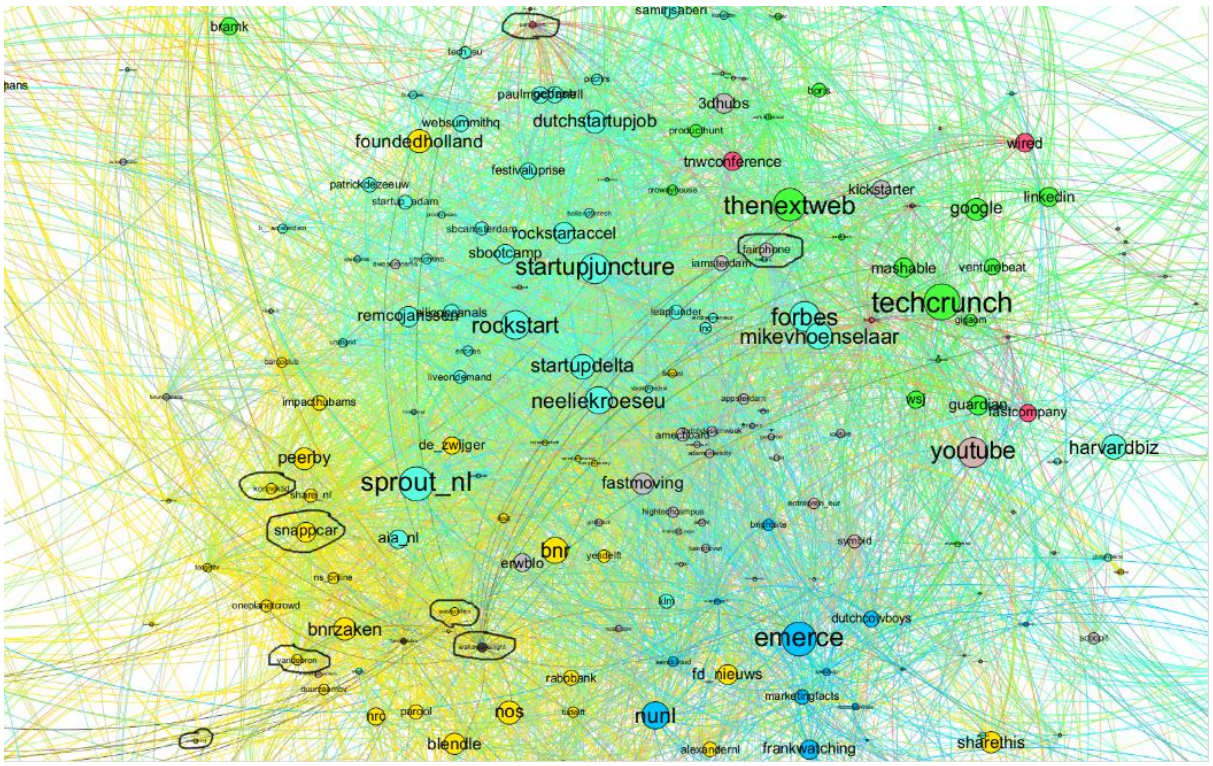

Figure 7. A close-up of the first graph (Figure 4) with the social startups encircled.

In the network above, a close up of the graph in figure 4, the pre-defined social startups are encircled. The first thing to notice is that five or six actors seem to belong to the same cluster in the bottom-left, although within the orange statistical community, some are more closely connected than others. In other words, it seems that within the cluster, there are smaller groups that cling together. One such sub-cluster might be Snappcar and Konnektid (middle-left) whereas another could be Waka-Waka and Bundles (more down- inwards), leaving vandebron (down-left) and Yournalism (just outside the inner-sphere) less tightly connected. Additionally, other startups are not positioned in this cluster at all. At the top, just outside the dominant sphere, there is Part-up, and Heppee

is placed just below the sphere, cropped off the picture above. Fairphone is the only company actively tapping into two groups which are far apart from the orange group; they seem to move in different social circles on the opposite side of the sphere.

IV. MODEST EXPLANATIONS

This small exercise is but one of the techniques to trace the social startups; the next step is to contact the entrepreneurs to enquire about the possibilities to arrange an interview. Typically, one first has to find the person most informed about the startup's history and the professional network. This would often be the founder or co-founder since they have been part of the entire trajectory the company made. LinkedIn proved to be of great help to track down the right person, especially in the somewhat larger companies like Snappcar and Waka-Waka; but how to get in touch with them? Where sometimes the company website includes the contact details of the (co) founder, often it did not disclose a personal email address or phone number. For an interview appointment, I would first email the person in question, and then call a couple of days later if they did not respond. Initially, I tried to contact people for an interview without informing them of the Twitter-based nature of the research so that they would not evaluate their Twitter behaviour beforehand, as this might bias the outcome of the conversation. This strategy made it possible to ask naive questions with the network data in mind for triangulation purposes[23]. In some cases, it turned out to be a 'cold call' to ask for an interview without mentioning the research methods, and therefore - especially in the second half of the interview series- some participants were asked directly to help interpret the network graphs. This tactic made the research more relevant to their company because the network analysis included valuable insights for their communication strategy, making them more willing to participate in an interview.

[23] A full disclosure of the intentions of the research always took place at the end of the interviews together with an informed consent at the start.

The round of enquiries resulted in appointments with five social startup (co)founders[24] being Laurens Waling [Founder of Part-up], Bart de Lege [CEO of Heppee], Michel Visser [Founder of Konnektid], Marcel Peters [CEO and founder of Bundles] and Maurits Groen [Co-Founder of Waka-Waka][25].

The interviews produced detailed explanations and numerous insights, so to present the most meaningful observations without drifting away in descriptive conversations, the next section will alternate between the most important findings and the empirical arguments to support or nuance them.

In very broad strokes the interviews with the five social entrepreneurs showed their place in the network is not a neutral given, it is a position in a politicised field of relations. To explain this claim, we have to go back to the theoretical statement that social startups are more vulnerable than profit-first startups due to their impact focussed attitude. The introduction outlined the theoretical misfit between an impact-driven mentality and a profit-driven market, which insinuates that social entrepreneurs are competing against the revenue-first startups over scarce resources. This supposed opposition and tension between the two groups was indeed reflected in interviews through the use of particular labels to name those who oppose the social entrepreneur, 'the other' so to say. When I presented one of the graphs to the interviewees, names like the "real startup" or "die-hard startup" (Panhuijsen[26]), the "classic money-making startup" or "traditional startup" (Waling), and the "real startup-startup" (Peters) were used to describe the dominant central cluster. This large group includes major Dutch incubators and accelerators like Rockstart, Startupdelta, and Startup Bootcamp, some

[24] Since underlying questions and hypotheses changed over time, people interviewed in an early part of the research were sometimes interviewed twice. The first interview was attuned to orientation and validation of the interview data, whereas the second interview gave time to test later interviews and do a collaborative reading of the network graphs (explained later on).

[25] Names are not fictitious with consent of the respective informants.

[26] Stefan Panhuijsen is part of Social Enterprise NL, and will be introduced later on.

startups, like Invoice Sharing, QwikSense and Proctorexam, and people directly related to these organisations, like Remco Janssen, self-proclaimed "godfather of Dutch startups" (Proudly Represents - corporate PR for startups et al., n.d.) and the famous startup ambassador, politician and former European Commissioner Neelie Kroes. These actors have a central position in the largest cluster of the entire system, which shows the status quo of the Dutch startup scene. These are the organisations that grow many Dutch startups; they have the funds and the means to do so -which leads to the inevitable question how social entrepreneurs tap into these resources?

The labels used by interviewees express their disassociation with these profit-first actors. Language is important here, for these 'labelling'[27] practices inhibit the access to resources, the right social network, and general recognition. To the question "do you consider yourself to be a startup" Laurens Waling responds with an answer that illustrates the tension between the 'real startup' and the 'social entrepreneur'. He replied, "Well, yes and no actually. Considering our ambition, we could be the new Uber or Airbnb, we do have the scalable potential and are looking for investors. So far, we are a typical startup. But then again, 'no', because I consider us to be a social impact movement rather than a classic 'money-making' startup with an exit strategy"[28]. Waling sees his company as an open source movement: it would stand for transparency, a decentralised and flat form of organisation, and openness. In the same sentence, he continues to say that these concepts oppose the traditional startup ideas of intellectual property, hard brand control, and a revenue focus. To the question of what the consequences are of being a social enterprise when searching for the right support, he answers "it does have some implications, but unfortunately not the ones we hoped for.

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[27] At this point, Marcel Peters should be credited with the observation that the network is actually organised around 'labels'. He said after consulting one of the network graphs: “I think most clusters exist around labels [...], and that is a shame because there is such a need for new ways to collaborate”.

[28] All interviews were in Dutch, with the exception of the interview with ShareNL, which was partially in English. All citations were translated by the author.

[…] We have explored what larger incubators and accelerators can offer, but they do not seem to fit our model, mostly because of our social ideas". Asking the same question to Bart de Lege [CEO Heppee] led to a similar answer in more illustrative terms: "there are many startups out there who can present their 'hockey-stick' figures [a chart plotting profit over time] to show investors that if they would invest their money 'here' they will see a rising line 'there' [demonstrating the expected return-of-investments with his hands]. However, we have no such thing; we have to find the right investor in a network that is quite intransparent".

Disassociation with the revenue-driven startups leads to forms of self-organisation which can be traced through the use of other labels. The term social startup has been adopted in this research to define a particular group of entrepreneurs and using this terminology in an interview often demanded an explanation like 'social entrepreneurs with a high growth potential'. So how would these entrepreneurs refer to themselves? Although they appear on the list of Social Enterprise NL, the 'social entrepreneur' label is subjected to precise communication and networking strategies. Where De Lege actively markets Heppee as a social enterprise to find a fit with potential investors, Michel Visser from Konnektid does not. So, although all interviewees recognise themselves to be social entrepreneurs, this label cannot be considered an undisputed common denominator.

Throughout the interviews there was one label recurrently used to describe at least part of the orange cluster: the 'sharing economy'[29]. Three larger startups are tied together for their strong affiliation with the sharing economy, being Snappcar and Konnektid - both part of this research, and Peerby -not included in the expert list. All three startups

[29] This concept signifies the introduction of different economic models as a result of the constant struggle between on the one hand the gift economy, completely outside the capitalist system, and the financial commercial economy (see for instance Eisenstein, 2011; Benkler, 2006 and Smolka & Hienerth, 2014). Yochai Benkler introduced the social principle of sharing as a means for exchange, rather than the commercial value of money (Benkler, 2006), but the concept 'sharing economy' is introduced by Lawrence Lessig in *Remix* (2008). Though gaining popularity, the sharing economy is quite heterogeneous in its definition. One could say it indicates an economic model in which access is more important than ownership.

define a new marketplace in which locals can share resources like time, skills or access. Konnektid is an online marketplace for people who would like to teach and/or learn something on a local, neighbourhood level. Snappcar is an online platform that brings together local demand and supply too, in the form of a car-sharing market. An actor that is also directly tapping into this small group is Peerby, an online platform where one can borrow small consumer goods from their neighbours. The network organisation Share NL is positioned right in the middle of this small group, they are "The Dutch knowledge & networking platform for the collaborative & sharing economy" ('shareNL (@share_NL) | Twitter', n.d.). In addition to commonalities in business model, their closeness is illustrated is by the fact that Konnektid's founder is also one of the co-founders of the Share_NL platform, though he is not actively involved any more. He and the founder of Peerby also know each other in person, meet regularly, and even work in the same Rockstart[30] facilitated building in Amsterdam.

Although five or six startups are linked in the graph, only three of them have built their business model on the 'sharing economy', thus this label is not sufficient to encapsulate all participating startups. Though the company vandebron, which is a peer2peer economy platform for local renewable energy would comfortably fit the sharing economy label, Yournalism, Waka-Waka, and Bundles would not. YournalismNL is a journalist crowdfunding platform, the least mentioned of social startups in this research. Waka-Waka produces solar-powered LED-lights (sometimes combined with a USB charger) and has its headquarters in Haarlem. When one light is sold, one is given to charity. The company was founded six years ago by two senior entrepreneurs. Bundles is the company behind the 'wasbundles' Twitter account which offers "'pay-per-wash' subscriptions, so customers pay for the performance -not the product" ('Bundles (@Wasbundles) | Twitter', n.d.). Customers pay a monthly fee for clean clothing, and Bundles arranges a premium quality and energy-saving machine to be

[30] Rockstart is one of the larger Amsterdam-based incubators with several spaces available. In addition, they organise three accelerator programs on an annual basis.

delivered and installed. The interview with Marcel Peters, CEO and founder of Bundles, helped to shed light on the use of these politicised labels. When introducing the graph at the end of the interview, he tried to explain his position outside the sharing economy cluster: "I would say there are two types of sharing economy companies, the so-called peer2peer economy services, like lending some tools to neighbours, and the access-over-ownership companies", and Bundles would belong to the latter category. Later in the interview, he referred to the entire cluster as the 'social or sustainable entrepreneurs', a mixed label adopted to address the cluster from now on, which illustrates the ambiguity of this group and the effort to name it is a direct reflection on what ties them together.

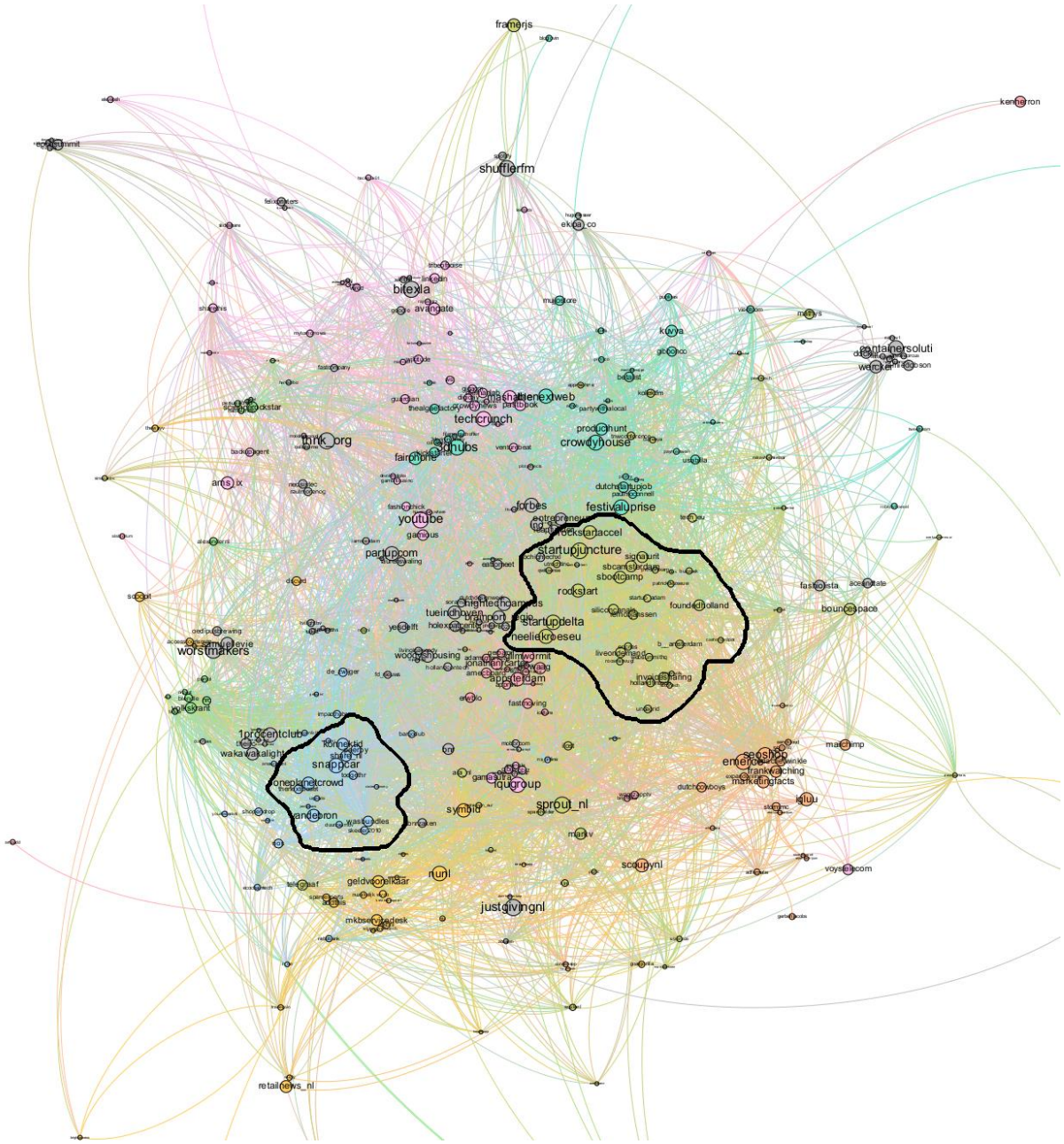


Figure 8. The third network plot (Figure 6) with both the 'social/sustainable' cluster and the cluster of 'real startups' (also containing large incubators and accelerators) encircled.

The organising principle of the social/sustainable startup cluster has been concretised in two ways so far: based on the sharing economy or sustainable entrepreneurship

principle at least five of them cling together, and their positioning opposes the 'real startups'. The tension between the two clusters is reflected in the network graph above, emphasized by highlighting the position of both groups. However, this apparent polarisation needs to be nuanced; encircling both the social/sustainable entrepreneurial cluster and the dominant for-profit cluster is not a neutral deed, for it now seems to suggest the two groups are strictly separated. These graphs cannot be read like a geographical map in which any point is exclusive to one territory since a node can have its relations spread over the entire ecosystem. In effect, some social entrepreneurs have close ties with 'real startup' incubators and accelerators; Heppee is currently selected in the second round at the Uprise Festival, one of the larger accelerator programs, and both Konnektid and Peerby are located in one of the Rockstart incubator offices -the same place I met for an interview with Marcel Peters [Bundles]. Thus, social entrepreneurs are far from separated from the dominant for-profit cluster. So what this map shows, is that the ties within the social/sustainable community are stronger than their relations with the actors in the dominant cluster. But if the coloured statistical communities are not mutually exclusive, then what do the trans-cluster relations imply for the interpretation of the entire startup ecosystem graph?

A Twitter mention is easily done, while being cited is hard (Mathieu Jacomy, 2016), and consequently, the larger and more central the node, the more diverse its support network is. Thus, the cluster with the largest and most central nodes has the most authority in the Dutch startup ecosystem. The other way around, the more periphery-based or the smaller the actor, the less cited or less diverse its affiliate network is.

Additionally, the two clusters have 'organizing actors' operating in between the two, and therefore another five interviews have been conducted with people from other organisations that help self-organise, integrate, or give face to the entrepreneurs. These were: Stefan Panhuijsen [research and public affairs at Social Enterprise NL], Pieter van de Glind and Harmen van Sprang [co-founders of ShareNL], Bram Pauwels [Chief

Marketing Officer at Impact Hub Amsterdam], Charlot Schans and Folkert Lodewijks [respectively project leader and program maker at Pakhuis de Zwijger] and Guido Dongen [community marketer at Sprout][31]. This selection of parties was guided by both the network analysis and the previous interviews with the social entrepreneurs. The network below zooms in on the sharing economy cluster to show how the five additional organisations connect them to the dominant network.

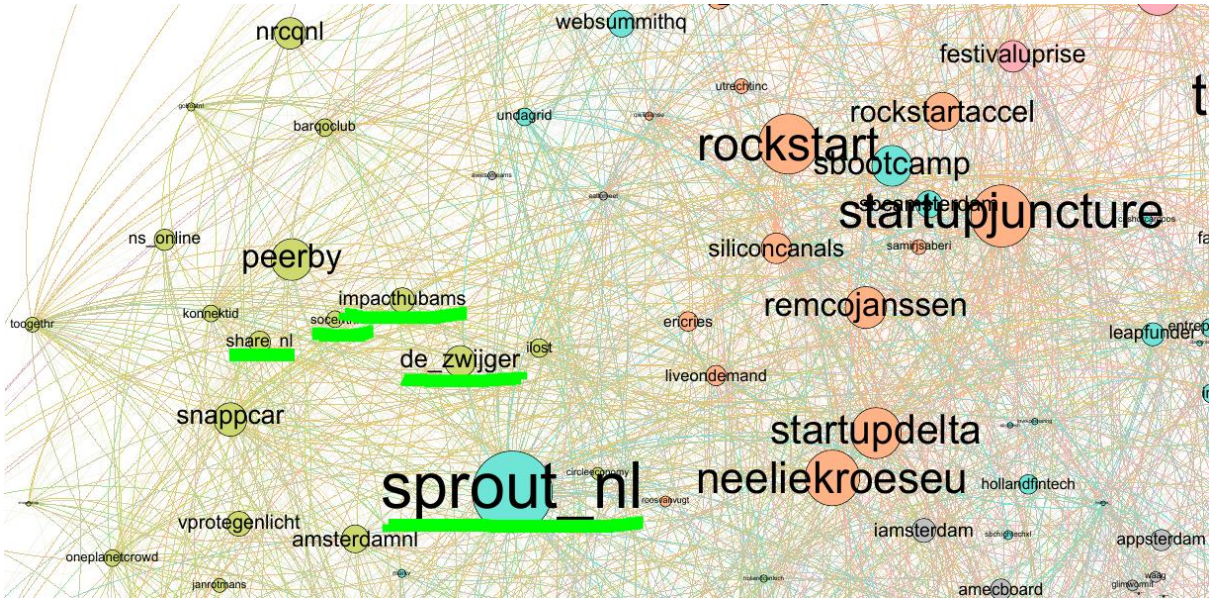


Figure 9. Another network plot, cropped to exemplify the players in the force field between the more peripheral 'sharing economy' cluster and the more central cluster of major incubators and accelerators.

[31] A small disclaimer is appropriate here. During the research, I felt it was impossible to exclude my own professional relationships and pre-existing knowledge from this research. Specifically, I am a professional consultant and have worked with Konnektid earlier last year, and for another of my researches at the University of Amsterdam I got in touch with Charlot Schans [Pakhuis de Zwijger]; other participants were interviewed without prior affiliations. Additionally, in some interviews I found that companies showed severe interest in the results of the research (for their own communication strategy), in one extreme case almost turning the interview into a job interview. Whenever the conversation went off topic, I actively intervened by suggesting to end the interview before discussing other inquiries. All points eventually emphasise that a researcher cannot take him- or herself out of the equation. I am not entirely excluded from the ecosystem I am conducting my research in; I have an active role in shaping this research which does not exist in a void: it could in turn have some kind of influence on the Dutch startup ecosystem.

The graph shows that each organisation has its role in facilitating the connections between the social/sustainable cluster (moss-green) and the larger, more central cluster of incubators/accelerators (red). ShareNL is a network organisation for sharing economy focussed startups. The branch organisation Social Enterprise NL [SocentNL] tries to give a public and legal framework to the 'social entrepreneurs'; their membership list has been used as an expert list for triangulation ends. The global social impact incubator 'Impact Hub' is located just in the middle; they have one of their offices in Westergasfabriek, Amsterdam. Pakhuis de Zwijger is a 'city-making' platform situated in Amsterdam, and Sprout is the publisher of the eponymous magazine to 'inspire entrepreneurs'. The following section will shortly discuss the role of the five actors since all of them were willing to participate in one or two interviews.

'ShareNL' and 'SocentNL' are the most central organising nodes[32]. They are literally and symbolically closely related which is reflected in a common affiliation network and position in the ecosystem; even their offices are situated in the same building. Both parties interact with government, corporates, startups, knowledge organisations, and media parties. But there are differences too; Social Enterprise NL can be considered a branch organisation in their goal to raise public awareness for Dutch social entrepreneurs. At the same time, they have an agenda to establish a better political climate for the social entrepreneur by lobbying for a dedicated legal framework. ShareNL is focussed on a slightly different theme, the sharing economy, and they seem to be more of a network organisation with a large and diverse list of affiliated organisations. Depending on the graph plotted, one could say ShareNL is the most prominent organiser of the largest social startup around the 'sharing economy' theme, whereas Social Enterprise is more of an outside force 'superimposing' the 'social

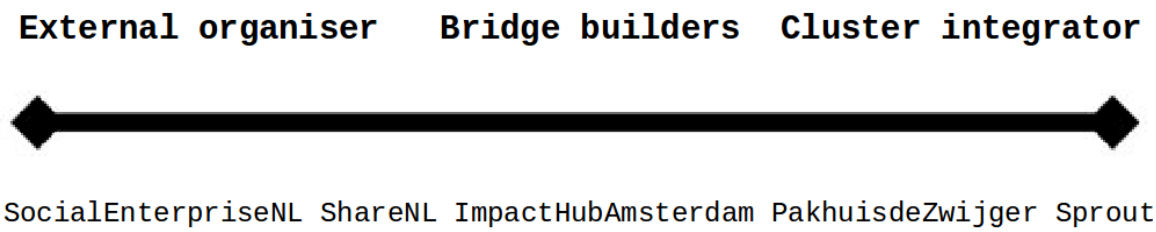
[32] Some interviewees have been interviewed twice, making a total of thirteen interviews with ten different actors: five social startups and five other organizations.

enterprise' label. Rather than connecting their members directly to other parties, they help members with common problems they might run into on their way.

Where ShareNL and Social Enterprise NL mostly help self-organisation, Impact Hub, de Zwijger and Sprout are more extrapolating and integrating forces. Impact Hub Amsterdam is the largest incubator that focuses on social entrepreneurs; they offer different specialised accelerator programs and are a hub in-between startups and other incubators. They invite social entrepreneurs in their physical coworking space, accompanied by a professional online platform and an international network that brings local Hubs together[33]. Pakhuis de Zwijger is a platform for 'city makers' (Pakhuis meaning 'warehouse') located in an old building at the IJ water side in which conference rooms can be rented and many events are organised every day. This network organisation hosts events almost every evening in collaboration with one of their many partners, adding up to about three events a day. Although they do not have any program attuned to starting entrepreneurs specifically, Charlot Schans observes they have plenty of 'young makers' joining their events. "I consider us to be the ones that will fill the gaps, every time we see a need emerging that is not met yet, we jump right in" […], "I think this is indeed a venue where entrepreneurs could find each other, but by a theme rather than a business model". The largest dot in light blue, right in between Rockstart, Startup Delta, Startup Bootcamp, and the social enterprise cluster is Sprout, part of MT publishing group. Different from other startup-specific news platforms, Sprout

[33] "I suppose that you have read the 'actieprogramma sociaal ondernemen Amsterdam' [action program social entrepreneurs Amsterdam]" ask Bram Pauwels, Marketing and PR at Impact Hub at the start of our interview. Together with a range of other stakeholders they tried to map the Amsterdam startup ecosystem from the knowledge and the network they have. In the detailed report that has been published last year, the status-quo of Amsterdam-based social entrepreneurs is mainly addressed to policy makers. The report is introduced with "The combination of impact and entrepreneurship typical to the social entrepreneur offers the opportunity to address social problems inherent to the city quicker and in a more innovative way" (Oetelmans, 2015, p. 3) followed by their definition of an ecosystem: "people and organization targeted at creating and growing social enterprises in Amsterdam. Social entrepreneurs, intermediaries, platforms, interest groups, investors, corporates SME, organizations and universities all take part" (idem., p. 10). The report depicts expertise on mapping the actors involved with the Dutch entrepreneurial ecosystem, which partially overlaps the results of this research. Unfortunately it is beyond the scope of this research, but suggestions for future research should include tracing the results of their categorizations within the network graphs to combine both their expert knowledge and these networked relations.

addresses the Dutch market exclusively to bring ‘inspiring entrepreneurial news’ – a conscious choice says Guido Dongen, the community manager. He explains that, although the news might come from social startup, their target audience is much broader because "the platform should be seen as leverage to selling the magazine or membership affiliations". When handing over the graph at the end of the interview, their online marketer joins us for the interpretation of the graph, suggesting "perhaps we are so close to the social startups because we are a ‘partner in crime' [...], and I think this is actually part of our goal, for we do really support their initiatives".



The continuum above summarises the roles the five organisations have for social entrepreneurs in three labels that I found best fitted their organisational tendencies, ranging from an 'external organiser' to a 'cluster integrator'. The external organiser stimulates self-organisation to obtain better social and political recognition, and the cluster integrator helps to integrate the message of the startups in other parts of the network. Obviously, this linear trajectory is a reduction of the complexity of the network to make it fit one scale. Organisations that are profiled on one axe include a network organisation, two incubators, a platform and a publisher, although they are inherently different in the type of organisation and their individual agenda. Nevertheless, the continuum is productive in its representation. Social Enterprise NL can be seen as the most overarching external force: they promote the 'social entrepreneurial' label. ShareNL is a bit more specified and integrated; they have a key organising role for the smaller sharing economy-related group -although it needs to be noted that they are

partnering with a mixture of actors that are insufficiently portrayed in the data. Impact Hub has a vast and diverse network with its arms reaching far into the international domain, but in practice, they remain relatively close to their support group. Pakhuis de Zwijger is a typical example of an institute bridging the gap between separate clusters, with their platform tapping into many public debates on city-making. Sprout is the most integrated actor actively integrating the social entrepreneurs, while being closely affiliated with the dominant cluster of incubators and accelerators.

Shortly looking back at the interview insights disclosed above, the graphs in which the startups are traced cannot be read as a map where one point can only belong to one region. Instead it is more fruitful to read the graphs as a field of forces. Actors between the social/sustainable cluster and the profit-first associated incubators and accelerators are important contributors to the continuous push and pull that keeps the network in a constant move (being ImpactHub, Pakhuis de Zwijger and Sprout). Also, the social startups do not form a coherent group of entrepreneurs. There is a dominant cluster which cannot be captured in one label, but the largest players have their business model based on the sharing economy, making for a small group surrounding ShareNL (being Snappcar, Konnektid, potentially vandebron). Others can be named in more generic terms, like ‘social entrepreneur', a term pursued by Social Enterprise NL, or sustainable entrepreneurs (including Waka-Waka, Yournalism, Bundles). Although the social/sustainable entrepreneurs position themselves in opposition to the profit-driven tech startups, some do have close ties with the largest central cluster of incubator accelerators associated with these 'startup startups'. Until this point, the more detailed analysis only included some social startups in the expert list, while companies positioned in an entirely different part of the network have not been discussed yet (these are Part-up, Fairphone and Heppee).

Social enterprises not part of the orange social/sustainable cluster (see figure 4) are an excellent means to validate the research, because their position in the ecosystem diverges from what one could reasonably expect. The fact that these companies are

placed elsewhere gives a chance to validate the network representation: does it make sense that they are positioned here? Fairphone is the company located between the dominant blue cluster, and the green international news media, on the opposite end of the cluster (Figure 4). Just like the Waka-Waka, Fairphone produces consumer electronics combined with a social impact goal. They sell ethically manufactured smartphones with the aim to change the entire production chain of raw materials. So what would explain their deviant position? Michel Visser's (Konnektid) answer to this question was that they grew in a London-based incubator and consequently move in different circles. "I have never seen them at any of the evenings here at Rockstart; they just have a different network". The encircled node in the top of the graph is Part-up, a platform for collaborative online work in the form of temporary team arrangements, based in The Hague. Laurens Waling and other co-founders have a combined total of about 30 years of experience in consulting, he explained in an interview. As noted earlier, Part-Up could not find the right fit with any of the larger accelerators/incubators, and started drawing on their professional network to be able to grow the company. Rather than moving in social entrepreneurial circles, he and his co-founding partners had many IT professionals in their network partly explaining their position outside the social/sustainable cluster[34]. Heppee is the developer of an app that helps to manage co-parenting in separated families, and they are situated just below the inner cluster in the first graph (figure 4). When I showed the graph to a team of three Heppee people, they observed that they were closely related to the national news publishers. "Well, we have always been spoiled with publicity so far, we are often mentioned, even while we don't actively participate on Twitter". De Lege was not surprised to find the sharing economy cluster to be closely related to Impact Hub and Pakhuis de Zwijger, and to the question why they are not positioned there, he answered:

[34] It needs to be noticed that location might have a role here too, where many social startups are based in Amsterdam, Part-up is an odd one out, settled in The Hague.

"we could have been part of the cluster yes […] but they are just very close"[35]. "They have actively teamed up, while we did not really make an effort". The most important finding of this small audit is that the alternative positions are easily explained, which in turn validates their general position. There are different reasons why their position is different in the network, being they grew in a London-based incubator (Fairphone), have a background in IT consultancy (Part-up) or are only passively engaging on Twitter (Heppee). These results only unveil a tip of the iceberg in means of validation, a worthwhile process which helps to explore both possibilities and limitations of this methodology.

What key insights have been brought to the table by this mixed-method enquiry? First of all, the startup ecosystem is not just a wide network of people, organisations, research institutes, et cetera; it is a politicised field of relations. Although startups are at the figurative centre of the ecosystem, it is a constant struggle over access and resources, a play between the 'haves' and the 'have-nots'. Moreover, interviews have shown that the assumption that social entrepreneurs want to tap into the resources of the dominant incubator/accelerator cluster is not necessarily true. Although partially disadvantaged by their impact-first mentality, social startups are more inclined to lean on their informal networks and alternative sources of financing, like crowdfunding, in which their inherent social goals may be used strategically to attract the right people. The second assumption that there is no place for the social startup in a profit-driven environment has been debunked by the mere fact that some of the social startups have close ties with, and even work in buildings of a large incubator. Thirdly, the interviews set forth a range of labels used to name, recognise and orientate in the communities surrounding the social startups. These names can work both unifying (as is the case in the sharing economy cluster) and separating (as is the case through the dis-associating

[35] Another explanation for Hepee's position might be that they are often mentioned by news media for their product, without actively building on their own relationships, as Heppee has not been very active on Twitter.

distinction between a social startup and a 'real' startup). Lastly, the networks provided a useful orientation to mark the actors that have an active part in the acknowledgement and integration of the social entrepreneurs. Talking to a network organisation, two incubators, a platform and a publisher unveiled the importance these actors have, while being completely different in activities, network, and agenda.

The following chapter will elaborate on how validation through triangulation is put into practice in the unique combination of network graphs, interview data, and the advantage of combining the two in the practice of collaboratively reading the figures. It will first discuss the best interview techniques with special attention to collaborative reading. Presenting the network graph to interviewees led to valuable interpretations of the networks, and every response shed new light on specific parts of the network. Secondly, these readings indicate that the representation of an ecosystem in a visual network is not neutral but has specific affordances, it invites the viewer for a particular sort of reading.

V. COMPLEXIFY the SIMPLE

After three exploratory interviews, I started introducing one of the graphs[36] at the end of every meeting, with the question how they could make sense of the network. These collaborative readings turned out to be one of the most valuable sources of information. Precise details needed to be disclosed for the interviewee to understand the nature of the network, and therefore I explained the method behind the graph, and how dots, lines, and colours could be read, without giving my own interpretation. While the respondents had detailed knowledge of a particular part of the ecosystem, they had never seen these startup-related parties plotted together in one network, and such a

[36] The graph selected for this paper are only three out of many graphs that have been made in order to strengthen the understanding of the complex network. The graph I would bring to an interview was selected on for its readability to the interviewee.

networked overview could suddenly position them amongst many organisations they know. Remarkably enough, the interviewees were seldom surprised by their place in the network, and most people were perfectly capable of explaining why they were situated in a particular place. The apparent straightforwardness with which interviewees read a network they had never seen visualised before validates the research itself, at least partially, and I often had to ask explicitly whether they could explain why the graph was so evident to them to be able to collect my insights. For instance, the first person I showed a graph to was Michel Visser [Konnektid], he was able to explain node by node why the actors surrounding Konnektid were important to the company –his answer contributed considerably to the consolidation of what is now called the 'sharing economy cluster'. Likewise, Marcel Peters [Bundles] explained his position just outside this group, which helps nuance the 'labelling' of the orange cluster (figure 4) with the more general dual term ‘social/sustainable entrepreneurs'.

Nevertheless, some interviewees had trouble reading the network for several reasons, which marks the limitations of a Twitter-driven analysis. One such example is found in the interview with Guido Dongen [Sprout]. Together with the head of communications, he had had difficulties reading the graph in terms of scaling. Since Sprout is mentioned by a great variety of actors in the network, its exact position is biasing, and panning and zooming are necessary to read the ecosystem from a screen. This problem occurred more often; to read the graph one needs to zoom in on the results which invite reading only the closest Twitter accounts, which are not necessarily the most relevant ones. Because of the sheer size of Sprout's affiliation network, we had to take into account the bigger picture to make sense of the graph. In other words, the struggle over readability is also evoked by the mere fact that the figures are shown on a small rectangular computer screen, in which one can either zoom in, to read the names of the nodes, or zoom out, to see the overview without the detail. A second problem is illustrated by fragments of two interviews. When he took a closer look at the graph, Stefan Panhuijsen [Social Enterprise NL] remarked: "you know what is striking to me? I barely see any

corporates, [… I would expect to find] banks like ABN AMRO and ING; and Fintech[37] would be more visible, and obviously the big four, so KPMG, PWC and EY [he is thinking] and Microsoft"[38]. Where the Social Enterprise NL website list 17 network partners[39], ShareNL collected about 200 partners, ranging from startups, corporates and municipalities to national and international research institutes[40]. When sharing these insights in the interview with Harmen van Sprang, he was somewhat disappointed when he found out that this great amount of partners was scarcely reflected in the data. In his surprise, he recounted his steps: "It probably has to do with the fact that the people we talk to within government and corporates do not use Twitter" […so] "this network does not incorporate the many phone calls we get over the day, the information we gather under the table and don't tweet about". The interviews reveal one of the most prominent limitations of a Twitter-driven analysis of the Dutch startup scene: Twitter is both the starting point and the filter. Twitter as a medium is the selection bias of this research, and perhaps one can consider Twitter to be the gatekeeper[41] of the visually present.

Even if an organisation has a Twitter account and is included in the selection, the communication strategies will differ from the first company to the next. The question what Twitter is used for was met with numerous answers, the most common answer being in line of [we use Twitter] 'to broadcast what we're doing'. Waling [Part-up] replied: "I would say the entire company started with the idea that we want to be an

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[37] The abbreviated term to describe tech startups operating in the financial sector.

[38] His observation is probably related to the founding partners of Social Enterprise NL: PWC, CMS, ABN AMRO, Stichting DOEN and the Anton Jurgens Fonds. Searching for these corporates, we found ABN AMRO as a node in an outlier position and Microsoft as part of the international tech platforms. Others might not have a prominent position from the startup point of view.

[39] http://www.social-enterprise.nl/partners/

[40] http://www.sharenl.nl/netwerk/

[41] The term 'gatekeeper' expresses the agency attributed to a medium.

example for everyone, so we should make things possible and show how it is done" (Waling). Or, in the words of Groen [Waka-Waka], [we have to] "explain what impact we make [… and illustrate] how something as small as a Waka-Waka can make a change". Nevertheless, there are some complications. Where some parties had a specific strategy in their communication on Twitter, others were still in the phase of exploring what Twitter can be used for (like Heppee, mentioned earlier). A second point is that, in some cases, a personal Twitter account would take over parts of the functionality of the company account and vice versa. The remark 'it is too bad the research does not include personal Twitter accounts' made two times by different interviewees confirms the broader collapse of the divide between the public and the private, the professional and the informal that was symptomatic to early network entrepreneurs. Lastly, many membership organisations like ShareNL, Social Enterprise NL and to a lesser extent the Impact Hub Amsterdam use Twitter to actively promote their members. This strategy biased their network position because, whilst three parties have an extensive professional network, they seem predominantly connected to their members alone.

Collaborative readings at the end of the interviews have been valuable for both interviewees and the interviewer, but the way in which the larger network is presented to its audience had a significant influence on its readings. The interpretations depicted that a network of nodes and edges floating in a void is not neutral in itself for it steers towards a particular interpretation. One tendency I observed during the collaborative readings, is that respondents were quick to interpret the presented results as if they were an all-encompassing truth, which raises questions on the politics of the visual representation of an ecosystem. How are the observers invited to read the graph, what agency lies in those colourful assemblages of connected dots?

First of all, Latour and Hermant's notion of 'olig-opticon' is helpful to explain the problem of the encompassing overview, which they argue to be an illusion; the contradiction between the overview and the detail. In the online digital exposition *Paris: ville invisible* [Paris: invisible city], Latour and Hermant include pictures that represent

Paris in some form of entirety: images of various control- and boardrooms regulating Paris' water and traffic flows, and a photo of people watching over the city (Latour & Hermant, 1998). Contrary to the idea one can see everything at once, the famous pan-opticon, the authors suggests the ‘olig-opticon', where one doesn't see much since "[t]he total view is also, literally, the view from nowhere" (ibid., n.p.). However, the things one is able to see, are very detailed. How is a network representation different from an olig-opticon? We have to develop a sensitivity to the politics such graphs entail in an interview context because an entrepreneurial ecosystem captured in a single graph is as promising as it is deceptive. It embodies the pan-opticon, the commitment to show an all-in-one overview, however blind it may be without additional perspectives.

Secondly, the networks seem to float in a void. Like the contours of a nation-state's territory in an atlas, it lacks the gradual transition between the actors included and the ones not apparent of the chart; the line between the present and the absent is endlessly sharp. Delimitation of the network through the selection of Dutch startups exclusively might seem superficial, since an ecosystem is not bound to the borders of a country. However, the entrepreneurial ecosystem concept builds on economic cluster theory which is inherently geographically delimited, and thus, geographical research 'limitation' should rather be considered as a focus. Besides, the 598 startups in the expert list, the startup-related incubators, clients, investors, knowledge platforms, and so on, are not limited to the Netherlands. The relationships that are fostered by Dutch entrepreneurs tap into various places, both local (i.e. Amsterdam, Eindhoven and Delft in the Netherlands) and international (America and the United Kingdom mostly), as is articulated by the international players that are included in the network graphs. Foreign platforms and news media, like Wired, Mashable, Kickstarter, TechCrunch, Guardian, and Forbes have their names printed quite eminently in the graph, in which they are somewhat grouped together. They can be seen as the lever to an international audience, as a portal to attention, knowledge, and financial resources from abroad. The

international players represent the level of international orientation of the Dutch startup, which has its scaling potentials at the core of its business model[42].

Mathieu Jacomy, one of the developers of Gephi, makes a valid argument by saying "the network is never a map of what you want to observe" (Mathieu Jacomy, 2016, p. 20). A network analysis cannot exhibit some self-explanatory totality, even though this might be the implicit aim of the researcher. Exploring a network sheds light on the networked characteristics and hints at what would be worth looking into, but to explain why a network has certain specificities, one needs additional perspectives. Alternatively, drawing on Latour and Hermant, one needs multiple olig-opticons, produced through both network plots and interviews with a selection of experts in the field explaining their position. The stabilities and instabilities generated by the constant shift of viewpoints allow the collection of valuable information, while providing insights into the limitations, incongruences, and tensions. The map represents a network in which the relations between the actors that *are included* seem to make a coherent overview of their communication *on Twitter*. Then again, certain necessary parties (mostly governmental, political and financial) were missing, and Twitter communication strategies do not always properly represent the closeness of social ties.

That said on the complications and limitations of the entrepreneurial ecosystem, to what extent can the mixed-method approach presented in this paper be standardised and reused to produce a more context-specific understanding? Where the characteristics of the Dutch startup ecosystem cannot be generalised into a larger

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[42] On the question why one chose to settle in the Netherlands, many answered something similar to 'just because I happen to be born here'. Comparing the entrepreneurial climate in the Netherlands to abroad often led to lists of the advantages and disadvantages of starting a Dutch enterprise. There are supposedly “many freelancers, there is a lot of knowledge and ambition, there is IT skilled personnel” (Waling). Others note that, while it is hard to make a comparison, they feel the Netherlands in general and Amsterdam specifically to be a creative place where many separate ecosystems collapse (De Lege). On the downside, people are slow to get things going, or as one interviewee expressed: “the Netherlands is just treacly” (Visser). And lastly, because the Netherlands is a small country one has to start to orient internationally from the very start (Waling).

theory, the presented mixed-method approach is reusable in close consideration of both its advantages and limitations. The re-appropriation of online data published by entrepreneurs is a useful and rather efficient way to visualise network information which would take a long time to gather by hand. Since the visualisations are based on online interaction, it efficiently and single-handedly portrays an affiliation network as the basis of an entrepreneurial ecosystem. However, collecting digital data should be done under scrutiny of both the platform in which the data was produced and the criteria used to 'enter the field', which leads to the following limitations: for scraping, analysing and interpreting purposes, this method is dependent on both the right tools and the knowledge of how to use them. Also one would need to find the expert list of startup Twitter accounts that will be both the starting point and selection criterion of the scraper. The last condition that needs to be met is that the percentage of people using Twitter within the respective entrepreneurial ecosystem needs to be high enough, so as not to have a strong bias towards the few people/organisations that happen to use Twitter.

To shortly recapitulate before going to the conclusion, this research complexifies rather than simplifies the entrepreneurial ecosystem, not aimed at the reproduction or standardising of an economic cluster, but at the mapping and understanding of what is there. Whereas some ecosystem studies include only one expert's point of view, the network-driven approach makes use of various positions -or olig-opticons: out of fourteen actors traced through the maps, ten have been interviewed to add their perspectives to the possible interpretations of the network. Thus, there is not one ‘broker' of the system prescribing what makes a coherent understanding of an ecosystem, there are multiple brokers each bringing their own insights. The choice for a messy network over a simplified iconographic diagrams, could be considered to be an argument over the readability and complexity. Diagrams might contain less information, but they are more readable for both experts in the field and people without a background in either the entrepreneurial scene or ecosystem studies. Plotted network graphs, on the other hand, are not that easy to read and need an explanation of both its

method and its meaning. Consequently, the ecosystem is not graspable in one visual image[43]; it is narrated through both imagery and text, but, where results might be messier than other formalised diagrams, the messiness allows a better representation of its complexity.

RECONSIDERING METHODS

The central concept of this thesis has been the entrepreneurial ecosystem and how it has enabled us to understand an economic cluster as a mixture of organisations, institutions, and entrepreneurs, tied together in a complex system of interdependent relationships. This holistic and comprehensive way to imagine a complex phenomenon through a system like representation closely resembles system-theory traditions that have been traced back to the collapse of the Californian countercultural ideology and post-war industry rationalities. Silicon Valley was central to the emergence of this paradigm, which has been used for close self-inspection, fuelled by the aim to understand and capture Silicon Valley's success. The subsequent rise of the field of entrepreneurial ecosystem studies led to two problems that formed the outset of this research. Firstly, many ecosystem enquiries are based on one of the successful American economic clusters, most notably Silicon Valley, and therefore many entrepreneurial ecosystem concepts presuppose an American socio-political system. Consequently, the effort to make one or multiple case studies into a more general theory for standardisation and reproduction purposes fails to acknowledge the local political-economic context from which the framework arose, while ignoring the local specificities in which a new ecosystem would be embedded. The second problem is that ecosystem enquiries often built on expert knowledge of one field- or academic expert, and led to somewhat simplified iconographic diagrams. The way in which attributes, principles,

[43] One might argue this statement actually undermines the notion of an ecosystem as a finite, delimited system. However, I would argue it to be an intervening argument rather than a contradicting one, since the exposure of the limitations of the system thinking-inherited paradigm is not problematic. Exploring limitations only enhances understanding.

pillars, actors or components are listed in the diagrams fail to do justice to the networked practices that tie the actors together.

Whereas network theory has been part of early entrepreneurial ecosystem concepts, the networking practices of participants have never been at the centre of the methodology. This research proposed an alternative methodology in which the networked practices of the Dutch startup entrepreneurs are core to the methodological enquiry. The Digital Methods Initiative provided the epistemological and technical grounds to repurpose the Twitter activity of Dutch entrepreneurs to advance to an understanding of the Dutch ecosystem based on their professional network. 474.613 tweets, predominantly published in the last five years, have been scraped from the accounts of 598 Dutch startups to plot their interactions in one extensive affiliation network. This network represents the ecosystem seen through the eyes of the entrepreneurs, while positioning actors which might never have been brought together in one vast network. The research followed social entrepreneurs with a strong growth potential, the social startups, for these innovative companies are most vulnerable in a system that is predominantly revenue-driven since they value social impact over profit. The triangulation of the Dealroom database of Dutch startups and the membership list of Social Enterprise NL resulted in nine social startups that were traced through the ecosystem network.

The networked representations of the ecosystem were an excellent means to orientate and explore the ecosystem, but the graphs could not explain *why* some startups clung together while others were completely scattered. Results of the interviews with five startups helped to switch from the exploratory overview of a network graph to the explanatory detail of an interview. Firstly, the interviews showed that the position within the network is not neutral, for it represents politicised struggle over access, knowledge and resources. Various labelling practices in the interviews exemplified the tension between the 'real' for-profit cluster, positioned centrally in the ecosystem, and the community of social/sustainable enterprises found towards the margins. Five other

organisations operating in-between the two clusters had an active role in the organisation, recognition or integration of the social/sustainable group. Secondly, the (co)-founders of the respective companies were perfectly capable of explaining their position in the network, proving the validity of the network, while providing empirical insights in the organising mechanisms at work in the ecosystem. And third, it turned out the visual representations of the ecosystem as a large affiliation network cannot be read like a geographical map, although it might be tempting to do so. Instead, it was more productive to think about the ecosystem as a moving field and consider the graphs as stills of a network that is subjected to continuing forces of attraction and repulsion.

These insights would have never been obtained without the collaborative reading of the networks and the naive questioning strategy. The value of these methodological practices is hard to underestimate since they shed light on the validity and the limitations of this research. By drawing on the publicly available tweets, Twitter has been the entry point to map the affiliation network while being the selection bias at the same time. Interviews revealed that, consequently, some parties seem under-represented in the networked representations of the Dutch ecosystem, mainly consisting of governmental, political and financial bodies. The collaborative reading showed that each graph is the result of a struggle over readability. Where more conventional ecosystems are relatively easy to read for both insider and outsider, the Twitter-driven network graphs demand some explanation before one could start to make sense of the densely connected dots. Hence, to optimise the readability of the position of the interviewee, I would bring the graph that best represented their place in the larger ecosystem. One last pitfall, which probably applies to any single-graphed representation of an entrepreneurial ecosystem, was that some interviewees tended to read this system-like reflection as some encompassing truth. This might be the affordance that lies beneath the colourful assemblages of connected dots, and it makes the presentation of an ecosystem as one large network as promising as it is deceptive. The mixed-method approach seems to have fulfilled the need to overcome these problems by constantly shifting between the exploratory overview and the explanatory

detail. Therefore I think we need to work towards the integration of data analyst's practices and qualitative research traditions, combined with the honesty to acknowledge that a new overview is as blind as any other perspective.

ACKNOWLEDGEMENT

I am grateful to my thesis supervisor Thomas Poell, who provided me with both valuable advice and critical support. I would like to thank my girlfriend, Lily Knox, for giving me the peace of mind to work in relentless hours, and my parents for their continuous support. This research abundantly draws on the visualisation tool Gephi and a great many other tools developed by the Digital Methods Initiative, and the outset of two expert lists built on the extensive database provided by Dealroom and the membership list published by Social Enterprise NL, thank you for sharing this information. And of course, this research would have never been possible without the many insightful conversations with Laurens Waling (Founder of Part-up), Bart de Lege (CEO of Heppee), Michel Visser (Founder of Konnektid), Marcel Peters (CEO and founder of Bundles) Maurits Groen (Co-Founder of Waka-Waka), Stefan Panhuijsen [research and public affairs at Social Enterprise NL] -thank you for the lovely lunch, Pieter van de Glind and Harmen van Sprang [co-founders of ShareNL], Bram Pauwels [Chief Marketing Officer at Impact Hub Amsterdam], Charlot Schans and Folkert Lodewijks [respectively project leader and program maker at Pakhuis de Zwijger] and Guido Dongen [community marketer at Sprout].

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