

transformative social innovation theory



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1 Introduction

This report elaborates on living labs by zooming in on the European Network of Living Labs (ENoLL) and the living labs in Eindhoven (the Netherlands) and Manchester (UK), which are connected to ENoLL. The living labs are studied within the TRANSIT research project which is on transformative social innovation (www.transitsocialinnovation.eu) and hence they are studied from the perspective of them being an example of (transformative) social innovation. In transit social innovations are new ways of doing, framing, knowing and organising and they are transformative if they alter, challenge or replace dominant structures.

1.1 Literature review

Living Labs are mainly presented as a method, an approach that is mainly applied in the Western societies (or Global North-West). Living labs should help to address contemporary societal challenges. Eriksson, Niitamo and Kulkki explain its role as follows: *“Europe (and the rest of the western world) faces many challenges in the future: integration of the new member states, continued competition in important business sectors, solving the healthcare issues of an ageing population, to name but a few. (...) The proposed systemic innovation approach presented under the name of Living Labs contributes to the coming challenges of mass deployment of ICT solutions as a mean to further develop the society involving the citizens. It brings the users/consumers/citizens into the system of innovation, thereby leveraging on a larger mass of ideas, knowledge and experiences etc. and substantially boosting the innovation capability (Eriksson et al, 2005, p.1).”* In this study we approach living labs as an example of a social innovation, they offer a platform for linking research and practice (across public, private and community sectors) and by doing so, they intend to develop innovative approaches for dealing with a variety of (often socially pressing) issues. Besides that living labs are themselves subject of (academic) study. In 2012 the management journal *Technology Innovation Management Review* dedicated a special issue to living labs and research also plays a prominent role within the activities of the European Network of Living Labs. The academic field of study about living labs is however, still rather insignificant in terms of impact and quality (Schuurman, De Marez and Ballon, 2015). Conceptually it is mainly rooted in more established theories on innovation including Open Innovation and User Innovation (Schuurman et al, 2015, Westerlund, Leminen, 2012) and it is considered part of the broader smart city approach (Schaffers et al, 2011).

Consequently, the concept of Living Labs also draws on a long tradition of user-centred and participatory research. It is not the first approach that argues for an active role for users in the design and development process of computer technologies. Important predecessors were identified by García et al. (2015) within certain periods as follows:

- 1960's-1970's: the Scandinavian cooperative and participatory design movement (e.g. the Scandinavian Collective Resource Approach from the early, cf. Ehn and Kyng 1987)
- 1980's: European Social Experiments with IT
- 1990's: Digital City Projects
- 2000's: The living labs originate from MIT

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The concept living lab originated from the work of Prof William Mitchell from MIT (US) (Erikson et al. 2005, LivingLabMIT.edu 2016). They started working in the area of smart/ future homes. They developed homes in which people actually lived and this create a real-life testing environment for various applications. Living labs can then be conceptualized as follows: “*Living Labs represent a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts* (Erikson, et al, 2005, p. 4).”

1.2 Case demarcation

The European Network of Living Labs (ENoLL) defines Living Labs as follows on its website: “real-life test and experimentation environment where users and producers co-create innovations. Living Labs have been characterised by the European Commission as Public-Private-People Partnerships (PPPP) for user-driven open innovation. A Living Lab employs four main activities:

- **Co-Creation:** co-design by users and producers
- **Open Exploration:** discovering emerging usages, behaviours and market opportunities
- **Experimentation:** implementing live scenarios within communities of users
- **Evaluation:** assessment of concepts, products and services according to socio-ergonomic, socio-cognitive and socio-economic criteria (ENoLL.eu, 2015).”

This report outlines the results of a study on the European Network of Living Labs (ENoLL) and two Living Labs that are linked to ENoLL, which are Living Labs in Eindhoven, the Netherlands and Manchester, UK.

ENoLL is a formalised network that presents itself as a community of Living Labs with a sustainable strategy for enhancing innovation on a systematic basis. The overall objective is to contribute to the creation of a dynamic European innovation system. ENoLL aims to support co-creative, human-centric and user-driven research, development and innovation in order to better cater for people’s needs (ENoLL.eu, 2015). ENoLL presents itself as an association with an open structure. It has however a clear core of fee-paying members and partners. The membership takes three different forms:

1. **effective members:** organizations which are legal entities that represent a Living Lab which was duly selected according to the ENoLL selection process and that pay the annual membership fee, 5000€ in the year 2010. There are currently 19 effective ENoLL member (ENoLL.eu, 2016)
2. **associated members:** organizations which are involved in the object and activities of the association, which are not selected according to the ENoLL selections process and which pay the annual membership, 5000€. Currently there are 2 associated members (ENoLL.eu, 2016)
3. **adherent members:** organizations that represent a Living Lab, which was duly selected according to the ENoLL selection process, they pay an annual administrative fee, and have no voting rights. Currently there are 184 adherent members (ENoLL.eu, 2016)

Currently there are also many members who have been selected by ENoLL as members in the past, but who are not active in the network anymore. They still keep their ‘ENoLL-label’. In total there are more than 400 living labs with an ENoLL label (including effective and adherent members). Moreover, ENoLL’s website also lists a number of strategic partners: World Bank; CAISEC (Beijing City Administration Information System and Equipment Center); Ubiquitous Network Industry and

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Technology Development Forum (UNITED), FAO (The Food and Agricultural Organization of United Nations); LLiSA (Living Labs in Southern Africa); Asian Smart Living Summer School; France Network of Living Lab (F2L); EBN, The European Business & Innovation Centre Network (ENoLL.eu, 2015). In this study we consider all members (effective, associated and adherent members) and all strategic partners as being part of the 'internal group of actors' that form ENoLL. This means that living labs that are not linked to ENoLL are considered being external to this case study.

The Eindhoven Living Lab is not a physical laboratory, nor is it one initiative. This Living Lab is a collection of initiatives that all share the philosophy and working method in the spirit of the Living Lab (see Chapter 5 on the Eindhoven Living Lab). This is about bringing partners together and creating/contributing to structures in which partners can meet. Over the last few years, the City of Eindhoven and its partners have developed quite a large number of successful Living Lab projects. 'Eindhoven Living Lab' is the 'umbrella approach' to incorporate these LLs and future ones into one, more integrated and integral approach. So that means that the 'Eindhoven Living Lab' is about:

- Living Lab initiatives in which the City of Eindhoven is taking an active lead role
- Living Lab initiatives in which the City of Eindhoven is taking a minor role as a partner, or which are merely facilitated by the City by providing the necessary infrastructure and the access to it; in this case the Living Lab can extend beyond the territory of the city

The Eindhoven Living Lab initiatives operated by the City include:

- Eckhart/Vaartbroek City Studios - physical meeting places in the city where citizens are challenged to discuss about the challenges within their district, and where exchanges with potential suppliers offering/developing solutions to the problem posed are organised. The City facilitates this process and engages itself to (co-)implement the solution commonly defined.
- Stratumseind 2.0 - Stratumseind is one of Eindhoven's most prominent nightlife areas. In this Living Lab massive amounts of data about people's activities are used to determine the effects of measures to improve the safety and to study which factors contribute to violence and discomfort.
- Roadmap for Urban Lighting - Eindhoven, 'City of Light', will be developing its urban lighting system into an integrated 'Smart Light Grid'.

The Eindhoven Living Lab initiatives, operated by partners

- Slimmer Leven 2020 / Innovation Network for Active and Healthy Ageing - a cooperative network whose partners share the same ambition: to create significant breakthroughs in the fields of care, living and wellbeing that will, in the long term, be cost-efficient for society and generate added economic value.
- Dutch Institute for Technology, Safety and Security - DITSS' primary aim is to stimulate and realise research and innovation programmes en generate economic activity in the fields of public safety, terrorism prevention, cybercrime, public security, incident management and crisis management.
- Strijp S - A former Philips estate of 66 acres is being transformed into an inspiring high value environment with a mix of living, working and recreation. The whole area is a 'breeding room' for innovations, aiming to increase the value of the area and its infrastructure.
- Intelligent Lighting Institute -The Eindhoven University of Technology's Intelligent Lighting Institute investigates novel intelligent lighting solutions, researchers are developing new

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concepts for interactive lighting solutions, including 'brilliant streets', 'sound lighting', 'no switches allowed', 'lighting optics & rendering', and 'open light'.

- Sports & Technology- Sports & Technology is a triple helix intermediary organisation aiming to create better sport performance, to stimulate sport participation/active lifestyle, and generate/accelerate business (development).
- Dutch Integrated Testsite for Cooperative Mobility - DITCM is an open innovation organisation in which government, industry and knowledge institutes work together on the successful introduction of cooperative systems to sustainably support mobility and accessibility.
- Capital D / Design Cooperation Brainport- A platform for designers and design driven companies, organisations and knowledge institutes within the Brainport Eindhoven region (ENoLL.eu, 2015).

There are currently three organisations in Manchester associated with the Living Labs concept: MadLab, Future Everything, and the Shed. The latter two are members of the European Network of Living Labs (ENoLL). A fourth organisation, Manchester Digital Development Agency (MDDA), pioneered Living Labs in the city, and was a founding member of ENoLL; but MDDA closed in 2015 following funding cuts and re-organisations at Manchester City Council, which funded MDDA.

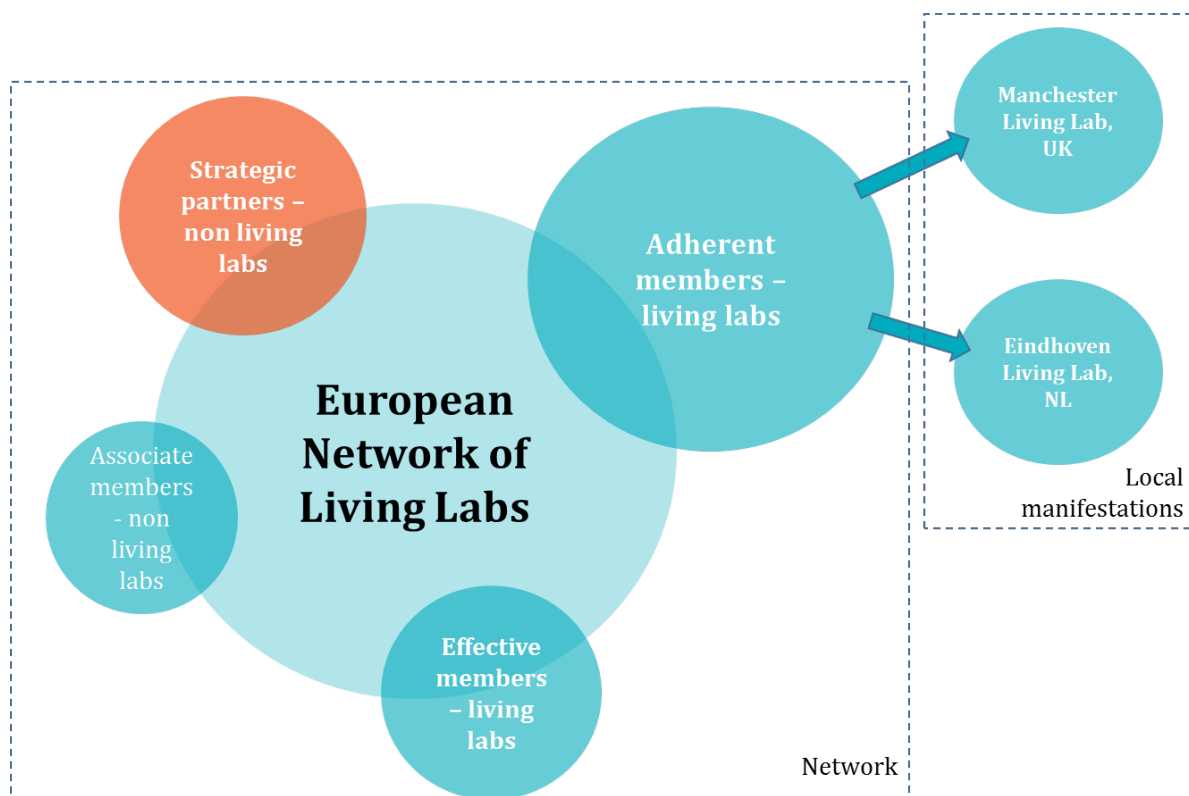


Figure 1: Graphical overview of Case Study Demarcation

Source: Developed by authors, 2015

1.3 Overview and structure of the report

This report starts with explaining the methodology that was used in this research. In this part it is explained how data has been collected and what kind of data has been collected and how this was then analysed. It also elaborates on the role of the type of relation that the researchers had with the cases. It then continues with an elaboration of:

1. The emergence, dynamics and agency aspects of the European Network of Living Labs
2. The emergence, dynamics and agency aspects of the Eindhoven Living Lab
3. The emergence, dynamics and agency aspects of the Manchester Living Lab

The emergence mainly describes the process of how the network organisation and the two living labs came into being. What triggered their formation and how did they develop over time? The dynamics part of the research addresses in more detail how the network organisation and the two living labs have interacted with their context. They have been influenced by their context and they were influencing their context as well. The interaction with institutions and (strategic) partners is of specific relevance in this part of the study. Then the cases conclude with an elaboration on the agency of the network organisation and the two living labs. Agency deals among others with motivation and the ideologies and ideas that the people within the living labs have when it comes to bringing about change in society.

The report concludes with a synthesis of the three case studies, this part presents short summaries and some conclusions based on the analysis of all three cases that are described in this report. As is mentioned in the introduction section, this report is part of a larger endeavour of collecting data in to support the process of theory development on transformative social innovation.

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2 Methodology

2.1 Researcher relations to the case

The two researchers that developed this case study report were not very familiar with the concept of living labs before. They both have a background in subjects that are only indirectly connected to the living labs field of study. Adrian Smith is a Professor of Technology & Society at SPRU (Science Policy Research Unit) in the University of Sussex. His research expertise is on Grassroots innovation, Innovation studies, Politics of technology, Science Technology and Society (STS) and Sustainable development. Saskia Ruijsink is an urban planning and development researcher, lecturer and trainer, focusing on topics including participatory planning processes, complexity, self-organisation, community initiatives and informality in urban development, sustainable urban development and placemaking.

The living labs in both Manchester and Eindhoven have a strong emphasis both on using technology and on engaging citizens and a broader group of stakeholders. Both researchers have an affinity with technology and are interested in grassroots and community initiatives.

The researchers had rather easy access to the local case studies and were familiar with the contexts that they operated in. Adrian Smith knew the lead contact of the living lab in Manchester personally. This allowed him to access other contacts fairly easy. Even if he does not live in Manchester, it was easy to reach for him and he had some basic understanding of the city, which provided some context for this research. Despite the personal connections, Adrian Smith remained neutral and critical in terms of assessing the actual impact of the living lab initiative. Saskia Ruijsink studied in the city of Eindhoven and that made her very familiar with the context of this living lab. She managed to establish a productive working relationship with the respondents from the Eindhoven living lab. Saskia Ruijsink also did the research on the network ENoLL. It was harder to establish contacts at network level due to the focus that the ENoLL board has on its members: they are paid by their members and prefer to spend all their time directly on facilitating them. Despite this, the necessary inquiries were made also at the level of ENoLL.

Concluding, the researchers have established pleasant and trustworthy working relationships in which it seemed that the respondents were willing to provide honest insights, the responses were useful and relevant to this study.

2.2 Overall methodology

This study drew on a various sources of data including interviews, participant observations, and desk research. The researchers used an adapted version of the general guidelines for the case study research that was developed for the TRANSIT research project. This was condensed into a topic guide (see Annex: Topic Guide) by Adrian Smith for guiding the interviews. The researchers Adrian Smith (Manchester Living Lab), Saskia Ruijsink (ENoLL and Eindhoven) and Claudio de Majo (who supported the data collection process for ENoLL as part of his internship) had regular

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Skype calls to discuss the progress and point out remarkable things. One of the things that became evident in those talks was that in both local cases the role of technology was very prominent.

2.3 Interviews

ENoLL and living labs, Saskia Ruijsink as interviewer:

- Respondent i –Paul Tissingh, General context Living Labs: civil servant engaged in CityLab010, 2nd of October 2015
- Respondent ii – Dimitri Schuurman, PhD. – Living Labs researcher, working at iMinds (Ghent, Belgium) one of the ENoLL effective members, 7th of October
- Respondent iii - Anonymous – researcher, engaged in establishing an Australian network of Living Labs, 28th of October 2015
- Respondent iv – Paolo Aversano –ENoLL staff member (Network Manager and Project Development), 29th of October 2015
- Respondent v – Ulas Akin- Smart City expert, linked to and knowledgeable about Smart City Istanbul Living Lab (SCILL) , 11th of September 2015

Eindhoven, Saskia Ruijsink as interviewer

- Respondent 1 - Tinus Kanters: Project leader of Stratumseind 2.0 living lab project; 8th of October 2015
- Respondent 2 - Anonymous: Strategic Advisor of Municipality of Eindhoven (internal); 14th of October 2015
- Respondent 3 - Gaby Sadowski: Strategic Advisor of Municipality of Eindhoven (internal); 1st of December 2015
- Respondent 4 - Anonymous: Politician who is part of the ruling coalition during the time of the study (2015-2016); 6th of January 2016
- Respondent 5 - Rob Woltinge: Area-coordinator of the neighbourhood Eckart-Vaartbroek; 13th of January 2016

Manchester, Adrian Smith as interviewer

- Respondent I -Alan Phillips; 14th of September 2015
- Respondent II -Steve Bustin; 15th of September 2015
- Respondent III -Paul Skelly; 15th of September 2015
- Respondent IV -Helen Gibbs; Wednesday 16th of September 2015

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2.4 Participant observation

ENoLL- Observations and conversations at:

- Participation as observant during the research day (25th of August) during the open living lab days from 25-27th of August 2015 in Istanbul; see: <http://www.openlivinglabs.eu/news/openlivinglab-days-2015-25-288-istanbul-turkey>
- Participation as observant (listener) in webinar for new/ interested/ potential ENoLL members, 10th of February 2016
- Parallel session hosted by Zsuzsanna Bódi from the European Network of Living Labs (ENoLL) at the Beyond Data Conference (2016), 29th of March, in Eindhoven the Netherlands; <http://www.smart-circle.org/beyonddata/>

Eindhoven Living Lab - Observations and conversations at:

- Connected Futures Conference (2015), 4th of November 2015, in Eindhoven the Netherlands; <http://connectedfuture.nl/>
- Beyond Data Conference (2016), 29th of March, in Eindhoven the Netherlands; <http://www.smart-circle.org/beyonddata/>

2.5 Document reviews

In addition to the interview and participant observation we did an extensive document review for the case studies. The review included:

- Websites
- Policy documents
- Communication in (online) media concerning living labs
- Research publications on living labs, including a recent and very detailed PhD thesis on living labs (Schuurman, 2015)
- Papers submitted for ENoLL conferences
- Archive of Newsletters and ENoLL conference documentation

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3 Transnational network ENoLL

3.1 Emergence of ENoLL

3.1.1 Open innovation, user innovation and social innovation

ENoLL puts innovation at the core of its reason of existence. ENoLL is a network and also a community of Living Labs and it: “aims to support co-creative, human-centric and user-driven research, development and innovation in order to better cater for people’s needs (ENoLL.eu, 2015).” This shows that ENoLL is dedicated to innovation in general and to aspects that are often associated with social innovation such as co-creation, a focus on human aspects, people’s needs and on the user.

In a joint publication of the World Bank and ENoLL innovation is defined as: “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Eskelinen et al., 2015, p16).” This same publication uses Henry Chesbrough’s (2003) definition for open innovation: “Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.” As also expressed in interviews (Respondent ii & Respondent iv) the latter definition of open innovation shows that the ENoLL also focuses on business innovation. Schuurman also highlights this: “The Open Innovation paradigm takes the firm’s perspective and examines the financial benefits of engaging in distributed innovation (Chesbrough, 2003; West & Bogers, 2013). In contrast, the User Innovation stream looks at distributed innovation processes from the perspective of the user (von Hippel, 1976; 2009) (Schuurman, 2015, p.9).”

Interviews (Respondent ii & Respondent iv) confirm that ENoLL does not have a specific focus on social innovation, even though social innovation is linked to the concept of the living lab. The living lab is mainly a form of an open innovation and this includes business innovation, technological innovation, social innovation and combinations of those. It addresses also the linking up of research and design (Respondent ii & Respondent iii & Respondent iv).

As introduced in the introduction, ENoLL defines a Living Lab as a real-life test and experimentation environment where users and producers co-create innovations and they emphasize that a living lab is promoted as a Public-Private-People Partnerships (PPPP) for user-driven open innovation. Even if it is not always mentioned as a characteristic, living labs are often associated with ICT.

ENoLL aims to contribute to new ways of doing, organizing, framing and knowing in its work on with and for living labs.

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Knowing: In general living labs aim to develop new knowledge through creative processes that actively involve users through a process of real life testing and sharing of information and knowledge. Relevant examples include the “Knowledge Workers Living Lab” and labs such as the Knowledge-based Lifecycle Innovation Lab (KLIO Lab) which are members of ENoLL (ENoLL.eu). As such the network is mainly *brokering* new knowledge. Even though ENoLL staff members also do participate in research projects (ENoLL.eu, 2015; Respondent ii & Respondent iv; cf Eskinen et al., 2015, Garcia et al., 2015). Additionally there are 5 domain specific expert groups that develop and share knowledge in their respective domains, e.g. Urban & Smart City Living Labs and Living Lab services for SMEs (ENoLL.eu, 2016).

Organizing: Living labs are actually invented to create new knowledge about certain issues, to do this by actively doing things (testing) and by organizing classical processes (of product development, of production, of policymaking, of delivering services, etc.) differently:

- Co-Creation: co-design by users and producers
- Exploration: discovering emerging usages, behaviours and market opportunities
- Experimentation: implementing live scenarios within communities of users
- Evaluation: assessment of concepts, products and services according to socio-ergonomic, socio-cognitive and socio-economic criteria.

ENoLL promotes those values of new ways of organizing. However, ENoLL is itself organized rather traditionally. It has 4 staff members (who are paid) that manage, administer and develop many of ENoLL activities. The ENoLL association is formally managed by a Council appointed by the General Assembly. Only the effective members can vote at the General Assembly, while each type of member can take part and be a candidate of the Council with certain restrictions (ENoLL.eu, 2015).

Framing: ENoLL contributes to a new framing about how we can learn and produce knowledge in a world that is changing fast and where more and more information is available in a less and less structured and hierarchal way.

- It is framing along the lines of developing knowledge and learning in new constellations with different actors (along the ‘co-discourse’ of co-creation, co-production, co-design which are all about forms of co-operation). The PPPP and the movement from triple to quadruple Helix are part of this new framing.
- It is framing along the process of doing things in an experimental manner, not only with new actors, but also in different formats, experimental settings, trial and error, explore and evaluate This is about being flexible, and contrast with the idea of making long term plans with clearly structured roadmaps on how to achieve pre-set goals.
- It is also contributing to a new framing on how we can make better use of new technology by addressing the SMART approaches (e.g. SMART city, but also SMART devices, SMART parking, etc.)

Doing: ENoLL brings a variety of living labs together that goes across various domains / sectors since living labs operate in different sectors, what binds them together is that they all are trying to promote innovative approaches through co-creation (Respondent ii & Respondent iv). As reported by ENoLL “living labs are active in many different domains (e.g., health) or/and can have a more territorial component (e.g., cities, regions) with a multi-thematic approach. Culture, art, design and creativity are important domains in the ENoLL community, and we’re participating in numerous

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different European initiatives focused on supporting creative industries (Pro.Europeana.eu, 2014)". The yearly meeting and the rest of the networking that ENoLL facilitates promotes cooperation and learning across sectors.

3.1.2 Development in Space and Time

The development of ENoLL in time and space presents a non-linear configuration. Although the network was officially created on November the 20th 2006 under Finnish European Presidency in collaboration with the European Commission and other public and private actors involved in innovation practices, ENoLL is the result of a longer process that can be traced back at least as far as the early 2000s. At that time there were already a number of Living Labs and there was actually a demand from the living labs community: there were Living Labs who were interested in having some kind of networking possibility. Besides that, they believed that clustering would create a community that could help to better represent the living lab position at European level. This process is known to have been a very bottom up process (Respondent iv).

3.1.2.1 Timeline

The ex-Network Manager Anna Kivilehto showed in a PowerPoint presentation published in 2013 how the ENoLL originated:

- The term 'Living Labs' originated from MIT (US), the concept then further developed in Europe
- Living Labs were supported by EC as bridging the gap between R&D and market entrance (faster take up of R&D results) and enable SMEs obstacles on local and regional markets in the fragmented European market place
- The further development of Living Labs is linked with EC policies and initiatives EU2020, Digital Agenda, especially through initiatives such as EIPs on Smart Cities, Active and Healthy Ageing (AHA), Future Internet, etc.
- Several Living Lab Initiatives were also directly supported by the EC (FP7, CIP ICT PSP programme, Interreg etc) as well as by various national programmes.
- Living Labs might further flourish in the context of Horizon2020
- ENoLL was launched in 2006 under the Finnish EU Presidency, grown into a non-profit international association representing a diverse community of over 300 ENoLL's "certified" Living Labs (Kivilehto, 2013).

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The timeline below illustrates the main milestones in the development of the living approach (also see section 1.1.) and ENoLL movement.

Scandinavian Participatory Design		European Social Experiments with IT	Digital Cities Projects	EC Funding for LLs		
				MIT: Living Lab	2006: ENoLL 2010: ENoLL formal	
1960	1970	1980	1990	2000	2010	2020

Figure 2: Timeline, from living lab to ENoLL

Source: construct of Author, based on Garcia et al. (2015) and Kivilehto (2013)

The path to ENoLL in Europe

Zooming in on the creation of ENoLL leads to the identification of a series of policies and initiatives of the European Union to promote innovation:

- **2000 – The Lisbon Strategy** – The Lisbon Strategy focused on the promotion of innovation research and innovative business aimed at favouring economic growth and social cohesion through the creation of local and international partnerships and networks (Lisbon European Council, 2000). Despite that it had been criticized for not being effective for the achievement of its goals (Wyplosz, 2010), it did provide breeding ground for the implementation of policies and initiatives that were supportive to the emergence of (a European Network of) Living Labs.
- **2005 – i2010 strengthening investment in innovation research** – June 1st 2005 by the EC, i2020 constituted a new strategic framework of integrated policies to promote knowledge and innovation and the creation of more better-quality jobs (Commission of the European Communities, 2005).
- **2006 – FP7’s** - FP7 (Seventh Framework Programme): the EU programme supported many research projects and a significant number of the research calls was favouring the development of Living Labs. FP& was “running from 2007 to 2013, the programme has a budget of 53.2 billion euros over its seven-year lifespan, the largest funding allocation yet for such programmes(European Commission Research Directorate General, 2007, p.2).”
- **2006- Conception of ENoLL- Helsinki Manifesto, under Finish EU presidency** - official creation of the “European Network of Living Labs” (ENoLL) took place on November 20th 2006, in collaboration with the European Commission in collaboration with the Finnish Government’s Information Society Programme, the Center for Knowledge and Innovation Research CKIR at the Helsinki School of Economics and other European Union Member States. The network should: “strengthen European global competitiveness and innovation [...] through necessary structural reforms and more efficient use of information and communication technology (ICT)” (Finland EU’s Presidency, 2006, p.1).
- **2007 – CIP: ICT support** -CIP ICT-PSP (Competitiveness and Innovation Framework Programme, ICT Policy Support Programme): just like FP7, CIP was launched in 2007 for a total duration of seven years (2007-2013) with an overall budget of € 3621 million (EC, 2014). The programme is aimed at encouraging a better use of ICT technologies and at promoting energy efficiency and renewable energies, and it was encouraging the formation of Living Labs as the various yearly work programmes specified.
- **2007 – First ENoLL workshop** – Living Labs indicated the need to have a formal organisation with resources: “Following the initial workshop on the European Network of

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Living Labs governance, which took place in Brussels in October 2007, one need emerged as the main result: an ENoLL Association should be founded, financed from membership fees, offering networking services and platforms for internal and external cooperation and policy making (ENoLL.eu, 2015)."

- **February 2010- foundation of the ENoLL association with fee-paying membership structure** - ENoLL has become a legal entity by establishing an International Non-Profit Association under Belgian Law.
- ENoLL is involved in a number of European funded projects (ENoLL.eu, 2015).
- **2010 – EU2020** – “The European Network of Living Labs (ENoLL) supports the Europe 2020 strategy for smart, sustainable and inclusive growth as a clear and concise European strategy to address the current economic, financial, societal and environmental challenges. In particular ENoLL supports the Digital Agenda for Europe, one of the seven flagship initiatives of the Europe 2020 Strategy, which sets out to define the key enabling role that the use of Information and Communication Technologies (ICT) will have to play if Europe wants to succeed in its ambitions for 2020 (Corvinno, 2011).”
- **2011 – FI-PPP-** Future Internet Public-Private Partnership Programme (FI-PPP): launched on May 3rd, 2011 by the European Commission and aims to address the challenges in the areas of technology, business, society and governance will have to be overcome if the future development of the Internet is to sustain the networked society of tomorrow. ENoLL is a partner in this programme (ENoLL.eu, 2015).
- **2012 – EIP-SCC** - The European Innovation Partnership for Smart Cities and Communities (EIP-SCC) is promoted on the ENoLL website as relevant project for its members: “The funding will be awarded through yearly calls for proposals for Smart Cities and Communities (SCC): €365 million for 2013 from the 7th Framework Programme as a first phase of implementation, with a special emphasis on ‘lighthouse projects’, and this EIP to be fully operational under “Horizon 2020”, the new research and innovation funding framework under the next Multiannual Financing Framework (MFF 2014-2020). However, a first wave of lighthouse projects will be launched as of now (2013) on the basis of a substantially increased budget. Rather than focusing on one sector as in the first year, selected demonstration projects will have to integrate all three aspects: energy, ICT and transport (ENoLL.eu, 2015).”
- **Horizon 2020** – The EU Research and Innovation programme for (2014-2020) with an estimated financial volume of nearly €80 billion. ENoLL is likely to benefit from this funding scheme (ENoLL.eu, 2015; EC, 2016).

Time line for membership waves

The European Network of Living Lab is developed in waves. The waves start off as an open invitation for new members. The entries are then assessed against a number of criteria, this is done by “a panel of experts selected from within the ENoLL community in a peer-led review process. All reviewers have experience in running living labs (LL) in different cultural, sectorial and geographical contexts (ENoLL.eu, 2015)”. The criteria have evolved and it is not necessary that an applicant fits all criteria. For the 10th wave the following criteria are considered:

- Evidence of co-created values from research, development and innovation
- Values/services offered/provided to LL actors
- Measures to involve users
- Reality usage contexts, where the LL runs its operations
- User-centricity within the entire service process

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- Full product lifecycle support – capability and maturity
- LL covers several entities within value- chain(s)
- Quality of user-driven innovation methods and tools
- Availability of required technology and/ or test-beds
- Evidence of expertise gained for the LL operations
- Commitment to open processes
- IPR principles supporting capability and openness
- Openness towards new partners and investors
- Business-citizens-government partnership: strength and maturity
- Organisation of LL governance, management and operations
- Business model for LL sustainability
- Interest and capacity to be active in EU innovation systems
- International networking experience

The growth of the network by waves is as follows:

- 2006: EU's Finnish Presidency inaugurates the first wave of Living Labs (First Wave). 19 Labs are added to the network; 47% of them are still active in August 2015.
- 2007: In the second wave 32 labs are added to the network; 38% of them are still active in August 2015.
- 2008: In the third wave 68 labs are added to the network; 28% of them are still active in August 2015.
- 2010: In the fourth wave 93 labs are added to the network; 23% of them are still active in August 2015.
- 2011: In the fifth wave 62 labs are added to the network; 42% of them are still active in August 2015.
- 2012: In the sixth wave 46 labs are added to the network; 30% of them are still active in August 2015.
- 2013: In the seventh wave 25 labs are added to the network; 68% of them are still active in August 2015.
- 2014: In the eighth wave 25 labs are added to the network; 96% of them are still active in August 2015.
- 2015: In the ninth wave -25 labs are added to the network; 100% of them are still active in August 2015 (Garcia et.al, 2015, p.41).
- 2016: In the tenth wave 18 labs are added to the network (ENoLL.eu, 2016)

Some moments and events seem to have been very critical in its development in waves:

- 2006, start of formal networking in 2006, big role of European Commission
- 2010, new organizational structure- pushed for by the ENoLL members
- 2010 was also the highest point in the 'living labs-hype' (see figure below from Schuurman 2015, p.155)

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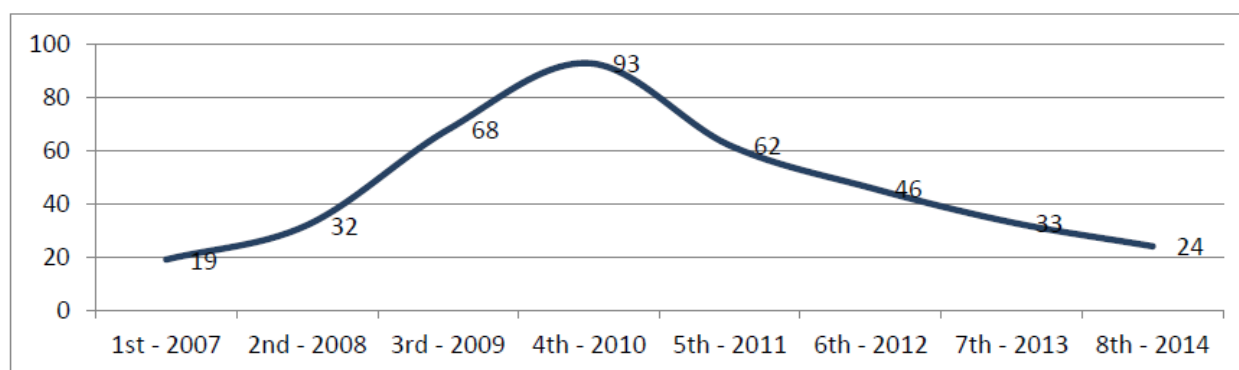


Figure 10: Evolution of ENoLL entrants

Figure 3: Evolution of new ENoLL members

Source: Schuurman 2015, p.155

The growth of ENoLL shows that it is a relatively young network. It seems that its peak in terms of growth has already taken place around 2010. In addition to this, it has proved to be hard to keep ENoLL members active and in the group of living labs that applied during the moment that the living lab 'hyped', we can see the largest share of inactivity.

3.1.2.2 Geographical coverage

ENoLL is called European Network of Living Labs because the initiative was born in Europe and led by a number of European organizations. Today around 80% of ENoLL's members come from Europe and around 20% come from non-European countries. In 2016 the annual open living lab days were organised in Montreal, Canada, so outside Europe. However, the main field of operation and influence remains to be in Europe. The European Commission and ENoLL are strongly connected and the EC sees ENoLL as the reference point for Living Labs on the European continent. Respondent iv also addressed that the European Commission benefits very much from ENoLL's existence.

The ENoLL council has most decision making power in the network. This council is also very "European". In 2016 a re-election of some members took place and some new members joined. The president (from Finland), vice president (from Spain), secretary (from Belgium) and treasurer (from Finland) were re-elected. The other members are from Spain, there are 4 other Spanish council members and Sweden, UK, Poland, France, Switzerland, the Netherlands and Turkey all have 1 council member (ENoLL.eu, 2016). The year before the geographical spread was nearly the same, only then there was also an Italian council member and not yet a Dutch (ENoLL.eu, 2015). The data on which the conclusions concerning the European dominance in the council are based can be found in the Annex: Geographical spread within ENoLL.

The illustrations on the following pages give graphical and numerical overviews of the geographical spread of the ENoLL members.

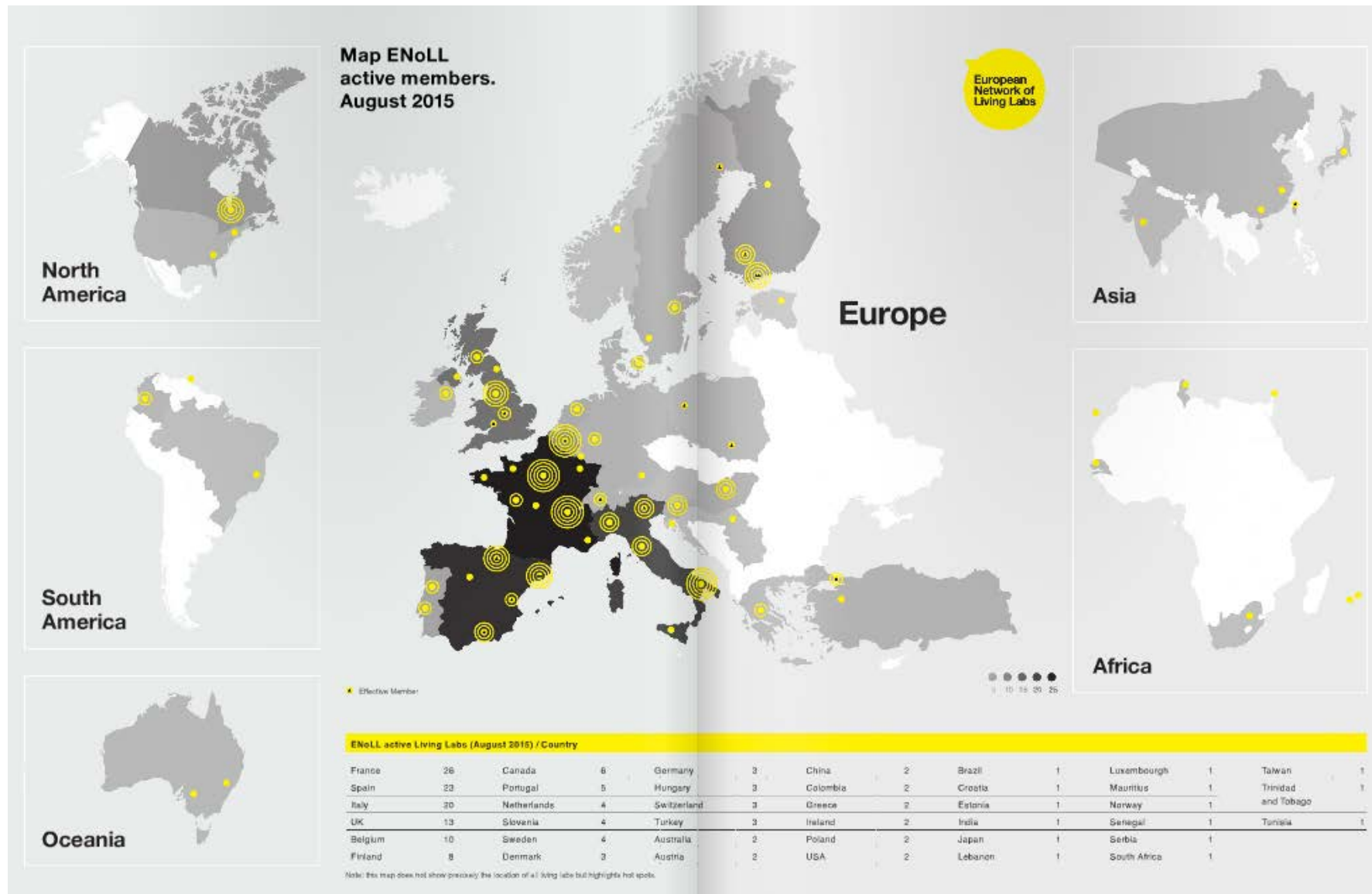
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ENoLL members on the map:



Source: ENoLL.eu, 2016 (http://www.openlivinglabs.eu/llmap_cc)

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Active ENoLL members per country and region (N.B. the locations of the LL are not exact!):

Source: Garcia et al., p. 38-39

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3.1.3 Relationship between ENoLL network and the local manifestations

ENoLL organizational structure

ENoLL is a transnational network with a membership structure, it has members (which are also understood as 'local manifestations' in this study) all over the world. ENoLL is an international non-profit association. The legal representative entity of the network is headquartered in Brussels, at the heart of Europe. ENoLL is formally organized and has the following managerial and strategic bodies:

- The ENoLL Council
- The ENoLL General Assembly
- The ENoLL secretariat

The association is managed by a Council appointed by the General Assembly. Only the effective members (see section on members below) can vote at the General Assembly, while each type of member can take part and be a candidate of the Council with certain restrictions.

The ENoLL Council provides strategic guidance to the network. It monitors and directs the activities of the Brussels ENoLL office and the activities of the ENoLL Work Groups, Special Interest Groups and Task forces. ENoLL Council with the lead of the Chair, prepares the draft annual ENoLL Work Programme and budget, and presents these to the ENoLL General Assembly for discussion and approval. The ENoLL Council is responsible for the implementation of the Work Programme, in line with the budget

The General Assembly has all powers allowing the realisation of the objects as well as of the activities of the association. All members, effective, associated and adherent are invited to attend the Assembly.

The ENoLL secretariat is based in Brussels, Belgium on the campus of the Vrije Universiteit Brussel (the Flemish Free University) and is hosted by one of the Living Labs in the ENoLL network, iMinds (ENoLL.eu, 2016). The team has four professional and paid staff members (Director, Project and Business Development Manager, Network Manager and Project Development and Communications Officer and International Project Developer) that work for ENoLL on a full time basis. In other words, the ENoLL secretariat is their main source of professional employment.

Membership

There are various forms of membership. The majority of ENoLL members (local manifestations) are the members that entered ENoLL through the waves process described in the former section. Those 'general' members are referred to as 'adherent members' by ENoLL.

Adherent Members: living labs selected through ENoLL's Waves. This type of membership includes several privileges, such as inclusion in the ENoLL communication channels and the right to be present and participate in the ENoLL activities (General Assembly twice a year, Working Groups and Thematic Groups). Moreover, Adherent members do not pay any membership fees (only an annual administrative fee for 500 €), and therefore have no voting rights in the General Assembly (ENoLL.eu, 2015). More specifically, Adherent Members privileges include:

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- ENoLL Label: the possibility to use ENoLL's label as a proof of certification and be listed as recognized Living Labs on the network's website.
- Network Contact Point: access to basic network and secretarial services aimed at supporting networking and information activities among members.
- Communication and promotion services: subscription to ENoLL's monthly newsletter, promotion through ENoLL's catalog of Living Labs on the network's official website and through other Dissemination channels, EU's informational relay (e.g. funding, strategy and events), access to basic communication information (e.g. generic funding, workshop groups and member events).
- Learning and Educational services: access to ENoLL's workshops and educational activities.

Associated members: organisations (mainly companies, universities, cities, departments etc.), involved in the activities of the association that however are not selected according to the ENoLL selections process. These members are admitted to ENoLL's member activities through payment of the annual membership fee, but have no voting rights in the General Assembly. However, associated members get full rights to act and represent ENoLL and can present candidatures for the ENoLL's elected bodies (where they enjoy voting rights if elected): the Council's Chair, Vice-Chairs, Treasurer, Secretariat, Chairs for Working Groups and Chairs Thematic Groups (ENoLL.eu, 2015). Specific privileges include:

- Network Contact Point: access to basic network and secretarial services aimed at supporting networking and information activities among members.
- Communication and promotion services: subscription to ENoLL's monthly newsletter, EU's informational relay (e.g. funding, strategy and events), access to basic communication information (e.g. generic funding, workshop groups and member events).
- Project development service: support in project consortium building, support letters to proposal, direct ENoLL participation in proposals, performing tasks on behalf of ENoLL in funded projects.
- Brokering services: market place to offer services to all the members, access to professional communities to learn about best practices, brokering and partnerships with external organizations, information brokering.
- Policy and Governance services: right to be selected in ENoLL's council, possibility to create working groups on several themes, direct access and contribution to ENoLL policy actions.
- Learning and Educational services: access to ENoLL's workshops and educational activities.

Effective members: effective members have vote in ENoLL's organisation and strategic directions. Every adherent member can decide to upgrade its status and become effective member by paying the annual fee (€ 5.000). Effective members enjoy voting right at ENoLL General Assembly and representation rights for the aforementioned elected bodies of ENoLL. More specifically, Effective Members' services and privileges include:

- ENoLL Label: the possibility to use ENoLL's label as a proof of certification and be listed as recognized Living Labs on the network's website.
- Network Contact Point: access to basic network and secretarial services aimed at supporting networking and information activities among members.
- Communication and promotion services: subscription to ENoLL's monthly newsletter, promotion through ENoLL's catalog of Living Labs on the network's official website and through other Dissemination channels, EU's informational relay (e.g. funding, strategy and events), access to basic communication information (e.g. generic funding, workshop groups and member events).

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- Project development service: support in project consortium building, support letters to proposal, direct ENoLL participation in proposals, performing tasks on behalf of ENoLL in funded projects.
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- Policy and Governance services: right to be selected in ENoLL's council, possibility to create working groups on several themes, direct access and contribution to ENoLL policy actions.
- Learning and Educational services: access to ENoLL's workshops and educational activities (ENoLL.eu, 2015).

Relationships between living labs and network

As a consequence of the organisational structure and the various membership types, the effective members have most power in the project. They are also the members that pay the most significant fee of 5.000 Euro per year. As a consequence of the height of the fee it is most likely that the effective members are professionally operating living labs with a rather solid basis of financial resources. Many of the 'effective member' living labs are linked to established institutions such as a University (Laurea Living Lab), research institute (iMinds Living Labs) or municipality (Eindhoven).

3.1.4 Transformative potential of ENoLL

In the TRANSIT research project transformation is associated with altering, challenging or replacing existing institutions. Even if ENoLL is not actively trying to change institutions, it is indirectly challenging institutions since it is reacting to the contemporary and future challenges that existing institutions face by offering a framework for new institutional arrangements. So it would be more appropriate to claim that ENoLL is working towards a form of transformation that is about establishing new and innovative collaboration models in which existing institutions can learn to operate in new ways. In other words: they create something new by using existing institutions and structures, rather than that they focus on (drastically) changing the existing institutions.

The main challenges that ENoLL responds to are rooted in European bureaucracy. Its foundations were laid in Helsinki's manifesto that served as a "road map for self-renewing, human-centric and competitive Europe" in order to enhance competitiveness and innovation in the EU (Finland EU's Presidency: 2006, 2). It aimed at promoting co-operation between public and private sector. The Helsinki's Manifesto, to this day the official founding document of ENoLL, lists several reasons for the creation of the network:

- The network was explicitly conceived as an attempt to bridge the ICT gap with more advanced geographical realities such as Northern America as well as to contrast emerging countries such as China and India.
- The creation of ENoLL also responded to the urgent need to improve EU's competitiveness in terms of innovation-based economic growth, employment creation and productivity.
- The creation of ENoLL is also caused by the necessity to foster the development of a knowledge-intensive service economy in order to create a new European job market for well-educated European citizens.

In this context, the document explicitly reports that Europe's potential lies in its already formed and extremely productive service sector – accounting for 70% of Europe's total GNP and to its high share of public services, bigger than that of every other nation or continent in the world. Hence, the

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public sector should use its potentialities to promote innovation through public-private partnerships (PPP) (Finland EU's Presidency: 2006, 2-3). Therefore, the main purpose of the Helsinki's manifesto was to create relevant connections between the public and private sector through the implementation of Public-Private Partnerships (PPP) for promoting innovation and enhance productivity. This triple helix model would explicitly prioritize measures that could demonstrate immediate economic gains. In order to guarantee common objectives and tools among countries, ENoLL was considered as a platform for collaborative and co-creative innovation through a multi-stakeholder model based on Public-Private-Citizen-Partnership (PPCPs). As the Helsinki's manifesto has declared, ENoLL "is a cross-regional, cross-national and pre-market network, which creates multi-stakeholder co-operation models for public-private-citizen-partnerships (PPCPs)" (Finland EU's Presidency: 2006, 4).

It was also mentioned by respondent iv that ENoLL is focusing much on what he would call 'open innovation' and that model includes business innovation and social innovation. It aims to respond to challenges in the private, the public and the community sector and to bridge the sectors and the institutions operating in it. It does so in a rather progressive and evolutionary manner. When talking to various living labs that are associated with (/members of) the ENoLL it seems that the network mainly helps living labs that are already established to reach higher. It is however clearly not a movement of activist that together try to change the world at large because they are 'against' established institutions. It is rather a movement of professionals who believe in innovation and innovative institutional arrangements for making the world better.

But to really realize change remains hard as is illustrated by the following quote from a PhD thesis on living labs: "Living Labs are still explicitly regarded as potential solutions (European Commission, 2013b; Curley & Salmelin, 2013), but the fact that almost a decade of Living Lab activity all over Europe does not seem to have had a significant impact, is not a positive sign (Schuurman, 2015, p.14)." Also Kresing is critical; he observes a large potential in the living lab approach, but he does not see proof of its impact yet. The observations of Schuurman and Kresing are related to the following conclusions that are relevant to the research on transformative social innovation:

- ✓ Existing established institutions such as the EU acknowledge that the current societal challenges cannot be dealt with in the 'old institutional' set up and they then promote the living labs as a solution, and the living lab is then an innovative institutional arrangement that should also lead to innovative solutions for the challenges
- ✓ It is not obvious that this policy of promoting living labs indeed had an impact, it is however also not easy to measure this impact and it might also still be too early

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3.2 TSI dynamics

3.2.1 Changes in social context enabling ENoLL

This chapter addresses the dynamics between the European Network of Living Labs and its social context. In the TRANSIT research project it is understood that social innovations shape their social context, and that they are shaped by it. The 'social context' is understood in TRANSIT as:

- actors, initiatives and networks, including established institutions and structures
- societal events and trends
- discourses and narratives of change
- social innovation cluster and/ or field

Those components of the societal context are briefly interpreted and described in relation to the ENoLL network in the remainder of this chapter.

3.2.2 Actors, partners and established institutions for ENoLL

The European Network of Living Labs would most probably not have existed in its current form without the European Commission. The network was founded under EU's Finnish presidency, but also there was a considerable additional EU-push: "In 2006 the European living lab movement gained further momentum through a set of European Union (EU) policy measures, including the funding of "Corelabs" and "Clocks", two projects aimed at promoting and coordinating a common European innovation system for ICTs based on living labs and at hosting and promoting the establishment of the European Network of Living Labs (Garcia et al, p.21)."

Currently ENoLL has no formal EU link anymore. In 2010 ENoLL became a legal entity and this was pushed for by its members. As respondent iv expresses it: "But we, I don't think that we will be in the position to put European Commission logo on our website, nor, to be honest, it is our intention. Because that is not ..., what matters is the collaboration on very practical and hands-on topics. And this happens a lot with the Commission (Interview respondent iv, 29th of October 2015)."

Besides its strong linkage with the European Commission ENoLL has a number of formal strategic partners that are listed on its website (ENoLL.eu, 2016):

- **World Bank:** the collaboration between WB and ENoLL started on July 10th, 2012, through the signing of a Memorandum of Understanding. Since then, the two actors have been engaged in several projects and collaborations promoting innovation (WorldBank.org, 2012).
- **FAO:** the ENoLL-FAO collaboration was officialised in Rome on January 25th, 2011 through the signature of a memorandum of understanding and with a 2-days workshop "Innovating 4 Development" aimed at developing innovative ICT services, in order to favour sustainable innovation. Since then, the two have jointly promoted many initiatives.
- **CAISEC:** ENoLL signed a memorandum of understating with CAISEC on November 25th 2010 aimed at "work(ing) cooperatively towards the next generation of innovation". Since then, CAISEC has collaborated with ENoLL in several projects.

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- **EBN:** ENoLL signed a memorandum of understanding with EBN on 21st of May 2012. Since then, EBN has collaborated with ENoLL through the creation of workshops on innovation.
- **France Network of Living Lab -F2L:** the partnership agreement was signed on February 19th, 2013. F2L has supported ENoLL, mainly by initiatives aimed at promoting its label.
- **LLiSA:** the partnership between LLiSA and ENoLL was officialised on 24 February 2009, and mainly consist on cooperation and mutual exchange of knowledge, best-practices and experiences.
- **Ubiquitous Network Industry and Technology Development Forum (UNITED):** although not officially a strategic member, ENoLL has signed a memorandum with UNITED in order to “further their communication in the innovation areas of Living Labs, ICT service and technology innovation”.
- **Asian Smart Living Summer School:** Programme Office of Talen Cultivation Programme for Smart Living Industry, sponsored by the Ministry of Education (Taiwan) launched the Asian Smart Living Summer School of which the first held in Taipei (Nov 2011). This programme aims at Master Level Post Graduates intending to further enhance cross-cultural experiences.

In addition to those formalized partnerships the network seems to be heavily shaped by its effective members and by what happens in the contexts in which those members operate (see the section on the relationship between network and local manifestations).

Furthermore there are always new partnerships in the making. In 2014 the **Australian Living Labs Innovation Network (ALLIN)** started to establish linkages with ENoLL. Some Australian living labs are members of ENoLL, but ALLIN as a network organisation is not (yet) formally linked to ENoLL. ALLIN has been present in the open living lab days in 2014, 2015 and 2016 however (Openlivinglabs.net.au, 2016). During their presence there were discussions around possible linkages between ALLIN and ENoLL. ALLIN is interested in ENoLL because of:

- Learning opportunities, from ENoLL as a network and from the more experienced Living Labs within ENoLL;
- Liaising since Australia potentially brings in a new perspective, it can contribute with that. In the Australian method there seems to be larger role for University and a stronger role for research integration in design than you commonly see in many ENoLL Living Labs;
- Being linked to ENoLL gives a certain credibility and status and allows ALLIN to position itself in global network and global movement (interview respondent iii, 28th of October 2015).

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3.2.3 Societal events and trends

The main contextual changes that enabled the emergence of ENoLL were the ICT revolution and the increased attention for multi-actor collaboration models and user involvement. Garcia et al. summarize those contextual developments as various influential movements that all fit under the heading of “ICT innovation and user involvement” (Garcia et al, 2015, p.17).

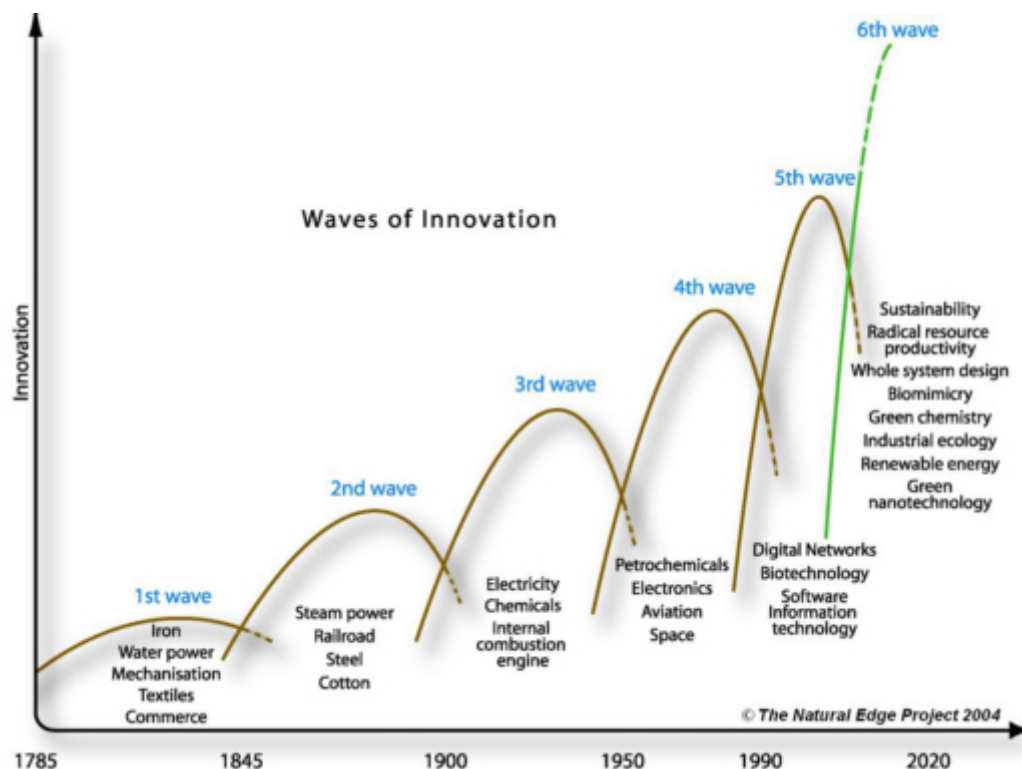


Figure 4: Waves of innovation

Source: Hargroves, K. and Smith, M. (2005), accessed via Naturaledgeproject.net, (2015)

Hargroves and Smith (2005) identified various waves of innovation and the focus on ICT and digital networks that really started to take off in the 90s is still highly influential. There is more recent work that zooms in on the ICT developments in more isolation and that is also relevant to understand how living labs have interacted with the ICT trends. One of the focus areas of this more recent work is smart cities. The iMinds living labs director Prof Pieter Ballon (iMinds is also one of the influential effective ENoLL members) also recently published a book on the Smart City (ENoLL.eu, 2016). It is interesting that Prof Pieter Ballon is a professor in communication science with a vast amount of knowledge and expertise around topics such as Internet of Things, which he gradually started to apply in the smart city approach. This shows how interdisciplinary this smart city and living labs field is, which also includes professionals with urban design backgrounds, among others. Balkjo (2014) describes the rise of smart cities in an online journalistic article and she explains the connection with the ICT related technological developments, which are illustrated in figure 5. In her article the development of the Internet of Things is seen as one of the main drivers of smart cities and she does not refer to living labs

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directly but she highlights the importance of “The creation of a massive IoT testbed that supports services and technology experimentation, and brings together companies, researchers and citizens to further research these areas (Balkjo, 2014).”

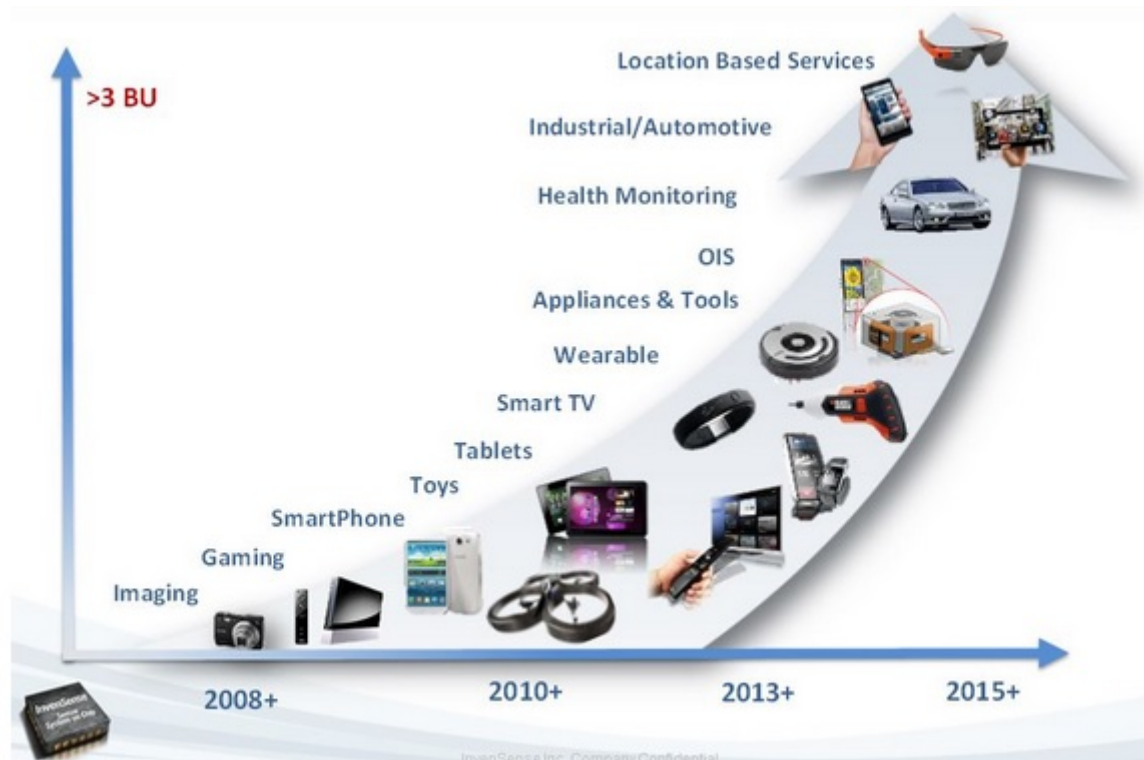


Figure 5: ICT related, 'Smart' innovations
Source: Balkjo, 2014

3.2.4 Discourses and narratives of change

ENoLL uses words like 'open', 'connected', 'ICT', 'users', 'smart', 'research and practice' and 'multi-stakeholder' to describe itself. The definition that ENoLL gives for a living lab in its FAQ list reflects its narrative of change and illustrates the discourse that it is part of:

“What is a living lab?: Living labs are defined as user-centred, open innovation ecosystems based on a systematic user co-creation approach integrating research and innovation processes in real life communities and settings. In practice, living labs place the citizen at the centre of innovation, and have thus shown the ability to better mould the opportunities offered by new ICT concepts and solutions to the specific needs and aspirations of local contexts, cultures, and creativity potentials.

5 key elements are must be present in a living lab:

1. active user involvement (i.e. empowering end users to thoroughly impact the innovation process)
2. real-life setting (i.e. testing and experimenting with new artefacts "in the wild")

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3. *multi-stakeholder participation (i.e. the involvement of technology providers, service providers, relevant institutional actors, professional or residential end users)*
4. *a multi-method approach (i.e. the combination of methods and tools originating from among others. ethnography, psychology, sociology, strategic management, engineering)*
5. *co-creation (i.e. iterations of design cycles with different sets of stakeholders) (ENoLL.eu, 2015)”*.

Respondent iv and ii both addressed that ENoLL fits in a broader movement of ‘open innovation’¹.

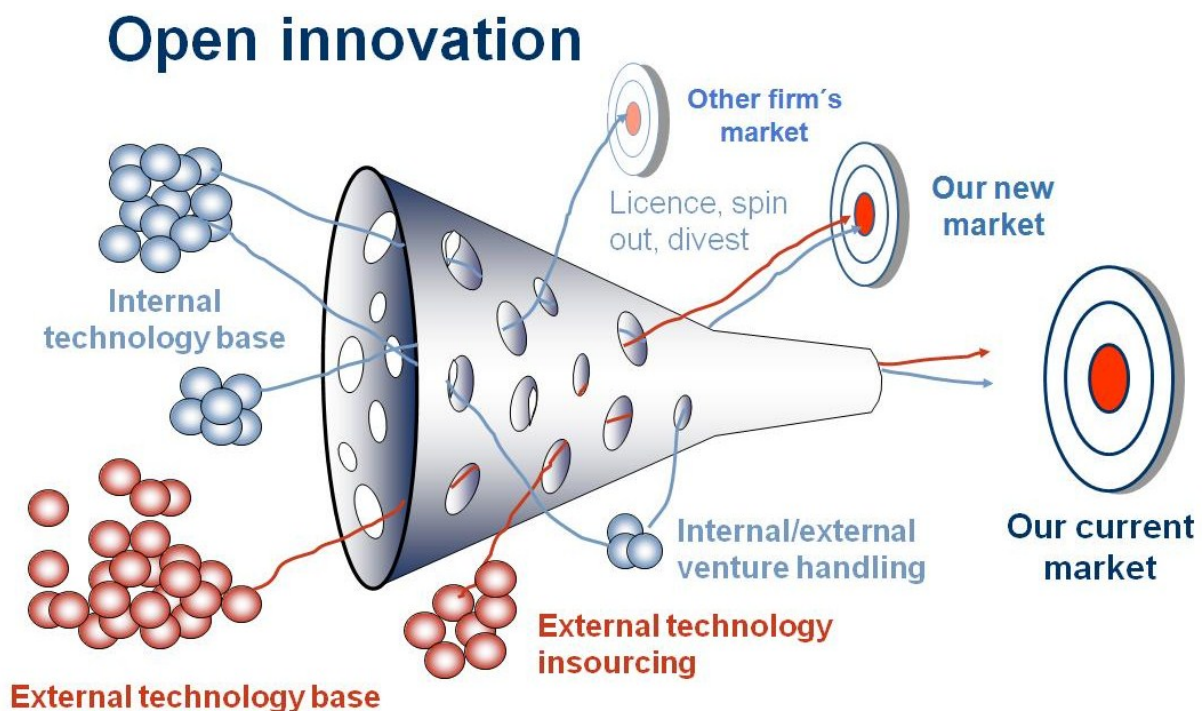


Figure 6: Open innovation model of Prof. Henry Chesbrough

Source: developed by Prof. Henry Chesbrough (2004); retrieved from: [Polymerinnovationblog.com](http://polymerinnovationblog.com), 2010 polymerinnovationblog.com/wp-content/uploads/2010/11/open-innovation-cropped.jpg

The concept of Open Innovation (see figure 6) is closely linked to the conceptualization of it by Prof Henry Chesbrough who is also the director of the Centre for Corporate Innovation at Berkeley University (California, USA), promoting Open Innovation which is about the use of purposive inflows and outflows of knowledge to accelerate innovation (corporateinnovation.berkeley.edu, 2016). Even if this concept is often referred to, it is not done so systematically and that is especially challenging for the quality of the academic work on living labs (Schuurman et al., 2015).

Respondent iv stresses that ENoLL also connects itself to other organisations (formal strategic partners and beyond) for the sake of understanding what is going on outside ENoLL, but also to be able to spread knowledge from within ENoLL and to make new connections. The latter seems to be

¹ N.B. Respondent ii is critical about this position, he also published on this topic.

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a very important underlying value: it is not possible to solve things in isolation, connection is needed. Living labs are about establishing connections, also connections that go beyond the obvious ones. Respondent iii also confirms this and stresses that bringing 'research and design' together is of critical importance for creating innovation within living lab. She noted during her first encounters with ENoLL that the design and practice component seemed very strongly developed in ENoLL, while the research component seemed only marginal.

3.2.5 ENoLL and urban studies

ENoLL has a number of expert groups:

- Urban & Smart City Living Labs
- Regional Living Labs
- Living Lab services for SMEs
- Research and future of Living Labs
- Health Living Labs

Those “*ENoLL Expert Groups aim at bringing together ENoLL members with a shared interest in advancing a specific area of knowledge or particular field. Five domain specific Expert Groups were created in 2015 supporting collaborative projects and knowledge sharing in key areas for the ENoLL community* (ENoLL.eu, 2016).” It is not surprising that the expert group on Urban & Smart City Living Labs is mentioned first on the ENoLL website, since living labs are often associated with urban development in general and smart urban development specifically. This is also illustrated by very connected terminology that is used in practice such as 'city labs' for example in the City of Rotterdam the city developed the CityLab010 which aims at engaging citizens and stimulating innovation (respondent i, 2nd of October).

There are many projects for Smart Cities funded by the European Union and ENoLL network participates at least in the following projects that relate to Smart Cities (ENoLL.eu, 2015):

- **City SDK**, a pan-European project aimed at creating development kits for partner cities in the fields of Mobility, Tourism and Participation. In particular, ENoLL is in charge of sponsoring the project through awareness-raising activities among the Living Labs.
- **SPECIFI** Project, designed in order to provide evidence over the positive impacts of European Smart Cities and Regions through different activities promoted by five Living Labs in three different cities.
- **My Neighbourhood**, a project aimed at redefining the concept of “Smart City” and thus recreate the lost sense of trusted communities, through the adoption of smart ICT tools.
- **ECIM**, a project designed to create smart cities through the bolstering of public transportation networks.

Additionally ENoLL promotes Smart Cities publications on its website:

- Ojasalo, Jukka (forthcoming March 2016), “Building An Open Service Innovation Platform For a City’s Needs: An Empirical Study On Smart Cities,” Proceedings of 10th annual International Technology, Education and Development Conference INTED 2016, 7-9 March, Valencia, Spain.
- Ojasalo, Jukka (2015), “Open Innovation Platform in a Smart City: Empirical Results,” The Journal of American Business Review Cambridge, Vol. 4 No. 1, pp. 195-202.

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- Ojasalo, Jukka (2015), “Open Service Innovation Platform in a Smart City,” in Renata Paola Dameri and Luca Beltrametti (Eds.), Proceedings of the 10th ECIE European Conference on Innovation and Entrepreneurship, University of Genoa, 17-18 September 2015, Genoa, Italy, pp. 521-528.
- Citizen Driven Innovation Handbook, co-production of World Bank and ENoLL.
- Smart cities need smart citizens by SMARTiP project
- Interdisciplinary Studies Journal on Smart Cities by Laurea University of Applied Sciences
- Let's talk about Smart Citizens by FutureEverything
- Hackable city transport apps by CitySDK. A mobility-focused case study from Istanbul. Written by Tristan Rutherford and published on the ETHIAD Airways Magazine, December 2014 issue.
- CitySDK Cookbook by CitySDK. Introduces the opportunities CitySDK APIs offer for cities and developers. It showcases the experiences Helsinki, Amsterdam and Lisbon have had with open harmonized APIs, giving concrete examples of the use of the current CitySDK APIs. Last part of the toolkit focuses on step-by-step guidance for starting your journey with CitySDK or any other API.

Another important indicator of the interlinkage between living labs and urban studies is the attention that this intertwined field got in research funding in Europe. The European Joint Programming initiative JPI Urban Europe, also focused on urban living labs in its research funding calls. One of the projects that derived from this is GUST ‘Governance of Urban Sustainability Transitions’ that is described as: “A project funded by JPI Urban Europe bringing together leading European research partners and practitioners to investigate and advance urban living labs” and that uses the url: www.urbanlivinglabs.net.

3.3 Agency in (T)SI

3.3.1 Theory of change

Within ENoLL there seems to be a strong belief in the theory of changing things together at various levels. The PPPP approach shows this: It takes the Public sector, the Private, Sector and the People. The quadruple helix (also see part 2 of this report on the local manifestation of Eindhoven) even puts education and research more central. All respondents support the idea that linking research and education to practice is critical for change. However, there seems to be no strongly aspired need to heavily change, challenge or alter the existing institutions and sectors. There is much more focus on making them work together and in differently organized processes, which might require different ways of thinking and working of the people in those sectors and institutions. The key words that are related to this are connecting (both at personal levels as well as digitally), open innovation, platforms, collaboration and Smart (also see section on discourses and narratives of change under TSI dynamics). In the methods that are promoted at the ENoLL website there is a strong emphasis on empowering citizens by including them more explicitly in decision making. An example of an event that was organized by ENoLL with the Barcelona City council in April 2015 was a workshop of half a day with the title “Why Labs? Empowering citizens as drivers of innovation” (ENoLL.eu, 2015).

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3.3.2 Sustainability

There is a tension between idealism and realism in terms of sustainability within ENoLL and in the various living lab initiatives (respondent ii, interview 7th of October 2015 and respondent iv, interview 29th of October 2015). This poses challenges in terms of the sustainability of open innovation communities. Sustainability takes different forms and it includes financial sustainability. For many living labs it is very hard to develop models that are financially sustainable, usually subsidy is involved, but respondents ii and iv address that it is important to develop labs that can run without as well.

But sustainability also means sustainable and continuous support at a political level. Political support refers to the governmental politics of for example the European Commission, nation states and cities. But there is also internal politics within organisations such as ENoLL. ENoLL needs support and commitment of its members, otherwise it has no reasons of existence. Respondent iv has repeatedly stressed how important the members are for ENoLL, they *are* ENoLL. The creation of the ENoLL foundation is a big achievement in that respect. ENoLL is an organisation that has four professional staff members that run it and it can sustain itself by the payment of membership fees and by its involvement in (mainly EU-funded) projects. This model is challenging, it requires hard work from the ENoLL secretariat, but it is worth it, since there is only a value of the network if there is also a real need and interest that people want to work (hard) for respondent iv, interview 29th of October 2015).

3.3.3 Who benefits?

The main beneficial of ENoLL are and should be its members according to respondent iv. ENoLL acts as a facilitator that tries to ease the collaboration between them. When this is done well, the result is that the members get in touch and start collaborating on proposal writing, organization of joint activities, etc. Another advantage of ENoLL to its member is its 'labelling' function. The concept of 'living lab' is used quite often as a label. Even if the concept of Living labs is very broad and is applied to a large variety of initiatives, there are many living labs that are happy to receive the 'ENoLL-living-lab-label' (respondent ii, interview 7th of October, 2015). An example is the living lab of Istanbul (Smart City Istanbul Living Lab (SCILL)). This living labs was established for prestigious reasons mainly, but in reality the living lab is hardly active (respondent v, interview September 11th, 2015). A case that is rather different is Eindhoven where there were a number of initiatives in the city that seemed to be in line with the living lab approach and it was decided that it would be good to showcase them much more under the label of the living lab (see part 2 of this report).

Respondent iv adds that in addition to the benefiting members, the European Commission benefits a lot from the existence of ENoLL. Even though there is no formal relationship between ENoLL and the European Commission, the Commission is aware of the contribution that ENoLL can make in many situations. ENoLL can put people in touch, ease collaboration (particularly this aspect). For instance, ENoLL is involved in Smart City initiatives, and connected to the network working on Smart City that is facilitated by ENoLL.

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3.3.4 Challenge of keeping enough autonomy: consensus vs conflict

Respondent iii believes that knowledge brokering is one of the biggest potentials of living labs. It can connect thinking, reflecting and doing. It also implies that actors from research, education, policy, engineering, businesses, non-profit, etc. collaborate. Collaborating thus has great potential, but it also has risks. It is critical that the actors involved have enough autonomy and are free to make their own decisions, and to bring really their own ideas forward. Doing this well requires a skill of productively channelling conflicts. It is important to push boundaries for innovation and it is unavoidable that there is conflict sometimes. However, there is a fine balance: if conflict escalates this is destructive to the process, if there is consensus with hardly any discussion, boundaries are not pushed and there is no room for innovation.

3.4 Summary, synthesis, conclusion

The European Network of Living Lab, ENoLL, is a formal network with a membership structure. It emerged within a context of strong support from the European Commission, both in terms of politics and in terms of initial funding. Its main function is to facilitate networking among its members and to put the topic of living labs on the agenda of policy makers and researchers in various cities and countries worldwide, even if it mainly focuses on Europe. ENoLL is relatively young network that is active for 10 years now, it started in 2006. It has more than 400 members, of which at least half is not active. The number of applications hyped in 2010 and reduced considerably afterwards, however, the activity rate improved in the last years.

ENoLL promotes a model of harmonious societal change that is mainly interested in *new collaborations* between *existing institutions*. This in contrast to other social innovations that were studied in TRANSIT that have a more disruptive style in realizing their transformative mission. ENoLL as a movement and living labs as such have a clear link to the emergence of ICT and the increased focus on user engagement in design. The living labs approach is also strongly connected to the smart city paradigm.

It is hard to judge if ENoLL is really empowering others. ENoLL describes “*empowering end users to thoroughly impact the innovation process*” as one of the key elements of a living lab (ENoLL.eu, 2016). But if the fact that ENoLL says this really makes an impact on the end users (which are for example citizens in urban projects) is not very likely. Additionally, it seems early to tell if living labs really make an impact at a more macro level of boosting innovation (cf Schuurman, 2015).

4 Local Initiative #1: Eindhoven Living Lab

4.1 Introduction

The Eindhoven Living Lab does not have one formal definition there is no website and no formal organisational structure. It is rather a collection of initiatives and also a philosophy and an approach to facilitate learning and collaboration in the development of the city. The Eindhoven living lab is described in a variety of formal documents (policy documents, information leaflets, powerpoint presentations) though and it pops up in the media in many different forms. Two important descriptions for this study are:

- ✓ The description of the Eindhoven Living Lab on the website of the European Network of Living Labs (ENoLL) which says: “Situated in the center of the Brainport Eindhoven region, the city of Eindhoven has a strong commitment towards its citizens to enhance the quality of life, by mobilising the creative power of triple helix parties and citizens/end users all together. It is also opening up the city itself as a real-life testing ground for products and services with an added value that meet the needs of the end users. As such an extra – fourth – layer was added to the well functioning triple helix model by incorporating ‘The City as a Living Lab’ into the core of its policy: “The City of Eindhoven is not only the breeding room for innovation, nor is it only its production facility, it also wants to be the living lab of these inventions. We want the city and its citizens to benefit from our companies’ developments. (...) Eindhoven is the city where smart products and services are being developed and implemented, in close cooperation with the end users in real-life settings” (ENoLL.eu, 2014) .
- ✓ The acknowledgement of the Eindhoven living lab in the coalition agreement (the formally approved policy document that guides the general acts of the ruling parties in the municipality of Eindhoven); this agreement describes that the city of Eindhoven is ambitious and it is a Smart City, focusing on pioneering, innovation, sustainability, cooperation, dealing with societal challenges and it is a living laboratory, or a ‘living lab’. The agreement does not define a living lab but it addresses the importance of experimentation and argues that this implies that there needs to be room for making mistakes. It mentions that civil servants should feel ownership and responsibility for their work and they should have the freedom to experiment and make mistakes, as long as they learn from this. It concludes that this approach requires excellent communication and intensive cooperation between various urban partners and citizens (Eindhoven, 2014).

In interviews the living lab is described as ‘being typical for Eindhoven’ where there is cooperation that is “based on knowledge and networks, rather than a hierarchical pyramid structure” and that this is a slightly chaotic way to connect ideas and people which are operating in the real city and not in a building with computers (interview Respondent 2, 14 October 2015). It is also described as ‘a testing ground, where initiatives can grow (...) it is a way of seeing things and it is very practical, (...) it goes beyond dreaming and talking but includes realisation, doing things, which is not always easy, since you do not know beforehand if it will work out or not“(interview with Respondent 4 6th of January 2016). Living labs does not have the same meaning for all and this becomes clear since the respondents working for the strategy and economic department understand a living lab as an approach that is about experimentation and new forms of cooperation, they also link it to technology, ICT, big and open data and to the Smart city. Two other

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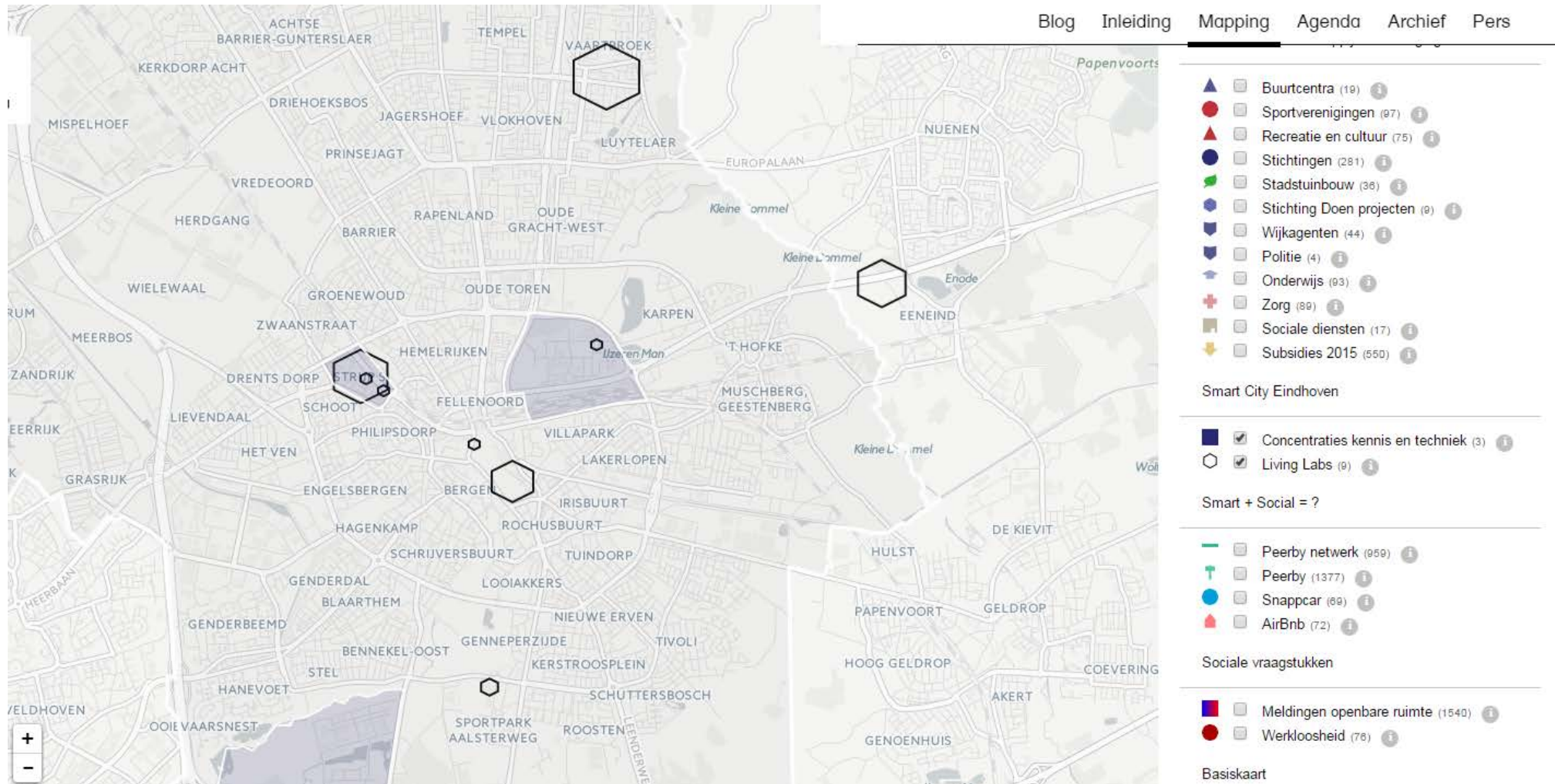
respondents (a local politician and an area coordinator) see it mainly as an approach that enables and facilitates the initiatives of non-municipal partners in the city. Sometimes technological possibilities are a motor for change, but the respondents agree that that in the end technology should be following the societal needs in Eindhoven, so the needs of the people should be the most important driving force behind the living lab initiatives.

4.1.1 Social innovation, new ways of...

Within TRANSIT social innovation is defined as a change in social relations that involves new ways of doing, new ways of knowing, new ways of organizing and new ways of framing. The living lab can be understood as social innovation following this definition.

The living lab is a place for experimentation and **doing** things in an experimental manner, where things can go wrong, is one of its main characteristics (interview Respondent 1, 8 October 2015). The lab aims to link citizens, the public and the private sector and research and education institutions and that is new way of **organizing** with the purpose of bringing about new **knowledge**, but also, with the purpose of addressing pressing issues in society (interview Respondent 1, 8 October 2015 and Respondent 3, 1 December 2015). The living labs is also a label that in itself is part of process of new **framing**. It uses the idea of experimentation that used to be done in a laboratory, but no applies to this to a real life setting. A deeper understanding of the new ways of doing, knowing, and framing is mainly expressed in the chapter on the social context and particularly in the section on values and characteristics.

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Map 1: Mapping of Eindhoven, the highlights show the Smart City Eindhoven and this includes the Living Lab initiatives (hexagons) and clusters of knowledge

Source: het nieuwe Instituut, <http://destaatvaneindhoven.hetnieuweinstituut.nl/mapping>

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4.2 Emergence of Eindhoven living lab

4.2.1 Introduction and role of actors

The Eindhoven living lab is still a young initiative but looking back at how it started, a project in the neighbourhood 'Doornakkers' in Eindhoven can be identified as the start of the Living Lab approach in Eindhoven (interview Respondent 3, 1 December 2015). The initiative was launched at the end of 2010 and the first real tests were done in 2011. The neighbourhood Doornakkers experimented with ICT applications in order to improve the health situation of senior residents of Turkish origin (Lambrechtse, 2011; Dichtbij.nl, 2010).

The Eindhoven City administration then started to use the label of the Eindhoven Living Lab for a number of innovative initiatives. Key words that characterize the initiatives are: experimentation, learning, cooperation and partnerships and in many cases using smart technologies. As mentioned the living lab approach was anchored in formal policy (coalition agreement) in 2014 and at the 5th of September 2014, Eindhoven was formally accepted as a member of the European Network of Living Labs.

All initiatives that are together identified as the Eindhoven Living Lab are initiatives in which a variety of Stakeholders are engaged. Both technical staff (civil servants: policy makers, project managers) and the political administration of the city are strong supporters of experimental activities in Eindhoven. But the municipality never acts alone and draws on the innovative power of the city that is present in its citizens, knowledge, research and education institutions and small, medium and large scale private sector actors.

The first Living Lab initiative in Eindhoven (in 'Doornakkers') was a joint initiative of the municipality of Eindhoven, the provincial government 'Noord Brabant' and Brainport Health Innovation. Brainport is a very important partner in the living lab.

4.2.2 The context: City of Eindhoven, a time-line

In order to understand the emergence of the living lab it is relevant to have a basic understanding of the context: the city of Eindhoven. This section describes how Eindhoven has become what it is now: it was elected as "Smartest Region in the world" and one of the 7 best global cities for start-ups and it was nominated for becoming the European Capital of Innovation in 2016 (Brainport.nl, 2016). By browsing the web one comes across a variety of news items that illustrate the City's focus on and performance in the field of innovation, design and (smart) technology.

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Eindhoven finalist European Capital of Innovation Award-
Source: <http://www.brainport.nl/>, accessed 29 January 2016

By drawing up a timeline with some major events for the city it becomes clear that the breeding ground for the living lab was developed in a period that is longer than a decade. The historical events are briefly described in this section and when relevant, they are related to the current situation of the living lab.

1900: Industry, Technology, Philips

Eindhoven has strong historical ties with industry and technology. The emergence of Philips founded in 1891 has been very important for Eindhoven. Philips started with the production of the light bulb but soon expanded and complemented lighting with electronics and technological innovation. In 1914 it also introduced 'Natlab', a laboratory for physics that was important for the innovations in Philips. This laboratory was the home to many inventions and innovations and it had an academic and experimental character (NPO geschiedenis, 2010).

The consequences of the growth of Philips were very substantial for the city, the employment grew but also the population of Greater Eindhoven had grown by 50% in 30 years' time. Philips also engaged itself in building houses for the rapidly growing workforce in 1909 (Brainport.nl, 2015b). In 1911 Philips, together with other industrials, took the initiative to develop a social housing association, among others to provide a healthier living environment for its employees. (Brainport, 2015b; Mijn-thuis.nl, 2015).



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Advertisement of Philips from the early period, Source:

<http://www.driehoekstrijps.nl/Kennismaking/Historie>

The role of Philips shows that Eindhoven has literally been built in partnership with the private sector and this tradition of partnerships seems an important contextual factor that shaped a breeding ground for initiatives such as living labs as can be illustrated by the following sentence: “and it is typical for Eindhoven that things emerge and develop in partnership” (interview Respondent 2, 14 October 2015). However, there is also a more critical reading of this history and that is the relatively large distance that the city has towards its citizens. It was mentioned that Eindhoven has no long or strong tradition of participation of citizens, this is illustrated by an old regional proverb “the Pastor and the Industrial say to each other ‘Will you keep them poor, then I will keep them stupid’” (interview Respondent 1, 8 October 2015). Today, the context has changed and citizens have more access to all kind of information and they develop initiatives themselves. Respondents have all indicated that the city now also aims to engage citizens more, but doing so remains a challenge.

1920

The city of Eindhoven merged with the municipalities Strijp, Woensel, Gestel, Tongelre and Stratum in 1920, which are still the names of neighbourhoods of the current city of Eindhoven (TU/e, 2015). Eindhoven grew as a consequence of the industrial development that was fuelled by Philips.

1950 - DAF

In addition to Philips, also D.A.F. has its history in Eindhoven. D.A.F. is an important brand for trucks. The production of DAF trucks started off as a machine factory in 1928, becoming a trailer specialist and from 1934 they continued their activities under the name Van Doorne’s Aanhangwagen Fabriek, or D.A.F. The company grew fast and was important for employment generation in the City and the region. DAF was more than a truck factory with a production site, DAF continuously innovated its products and despite many economic challenges, there are still many DAF trucks on the road today (DAF Oldtimer truck club, 2016; Brainport.nl, 2015b). DAF has been important for mainly the post second world war growth of the city (TU/e, 2015) is also an icon for the city of Eindhoven and adds to the city’s knowledge base and image of being industrial and focused on technology and innovation.

The coalition agreement mentions that Philips and DAF have been dominant in shaping Eindhoven in the past. After that, the role for the municipality became bigger and the city became a real service provider. Now we see another phase in which citizens, social organisations and private sector need to share forces and need to take joint responsibility for shaping a good living environment (Eindhoven, 2014).

1956 - Eindhoven University of Technology

The Eindhoven University of Technology was established in 1956. It responded to the need for highly educated engineers as a consequence of the presence of mainly Philips, but also DAF (IsGeschiedenis.nl, 2015). Today the University is an important knowledge partner in the city and also in the living labs. However, the collaboration with knowledge institutions goes beyond the University of Eindhoven, it also includes Applied Universities (Fontys) and Vocational Education

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institutions (interview Respondent 5, 13 January 2016) and the University of Tilburg (Brainport.nl, 2015c)

1980 - ASML

ASML is a spin-off of Philips. In 1984, Philips and Advanced Semiconductor Materials International (ASMI) created a new company to develop lithography systems called ASML. ASML started off in a wooden shed next to a Philips building in Eindhoven and by 1985 it grew to 100 employees and moved into futuristic-looking headquarters in nearby Veldhoven (ASML, 2016). Today ASML is an important partner in the high-tech cluster of Eindhoven with a lot of innovation capacity.

1997- Philips headquarter to Amsterdam

In 1997 the board officially decides that Philips moves its headquarters to Amsterdam, in 1998 the first employees move to Amsterdam and in 2001 the new Amsterdam-based headquarters are realised (NRC, 1998). The move of Philips was an important loss for the city, but the city seemed to have recovered well. One of the respondents mentions that the presence of Philips has really reduced now, but still the city kept on growing. She said: "Why did this City grow, while such an important corporation left the city? (..) The City develops based on a strategy and culture around innovation (..) an orientation towards the future (..) there is a culture of cooperation (..) if you engage in start-up there are immediately 3 people who come to support you (..), I have been engaged in 3 start-ups myself and I did not plan to do so, but it seems that it just takes you, you become part of it without knowing it.. and that is why there is a living lab here." (interview Respondent 2, 14 October 2015).

2010, 2014- Eindhoven Living Lab

The first living lab initiative started in 2010 in the neighbourhood Doornakkers as an experiment with ICT applications in order to improve the health situation of senior residents of Turkish origin (Lambrechtse, 2011; Dichtbij.nl, 2010).

In 2014 the Eindhoven City started to use the label of the Eindhoven Living Lab in its coalition agreement and at the 5th of September 2014, Eindhoven was formally accepted as a member of the European Network of Living Labs. The City of Eindhoven mentions the following about its ENoLL membership: "To be able to pick up knowledge from external organisations, to facilitate the process of finding partners for international cooperation projects and to be in the driver seat of the development of future policy we have entered the European Network of Living Labs (ENoLL) as a member" (Eindhoven 2015e, p.12).

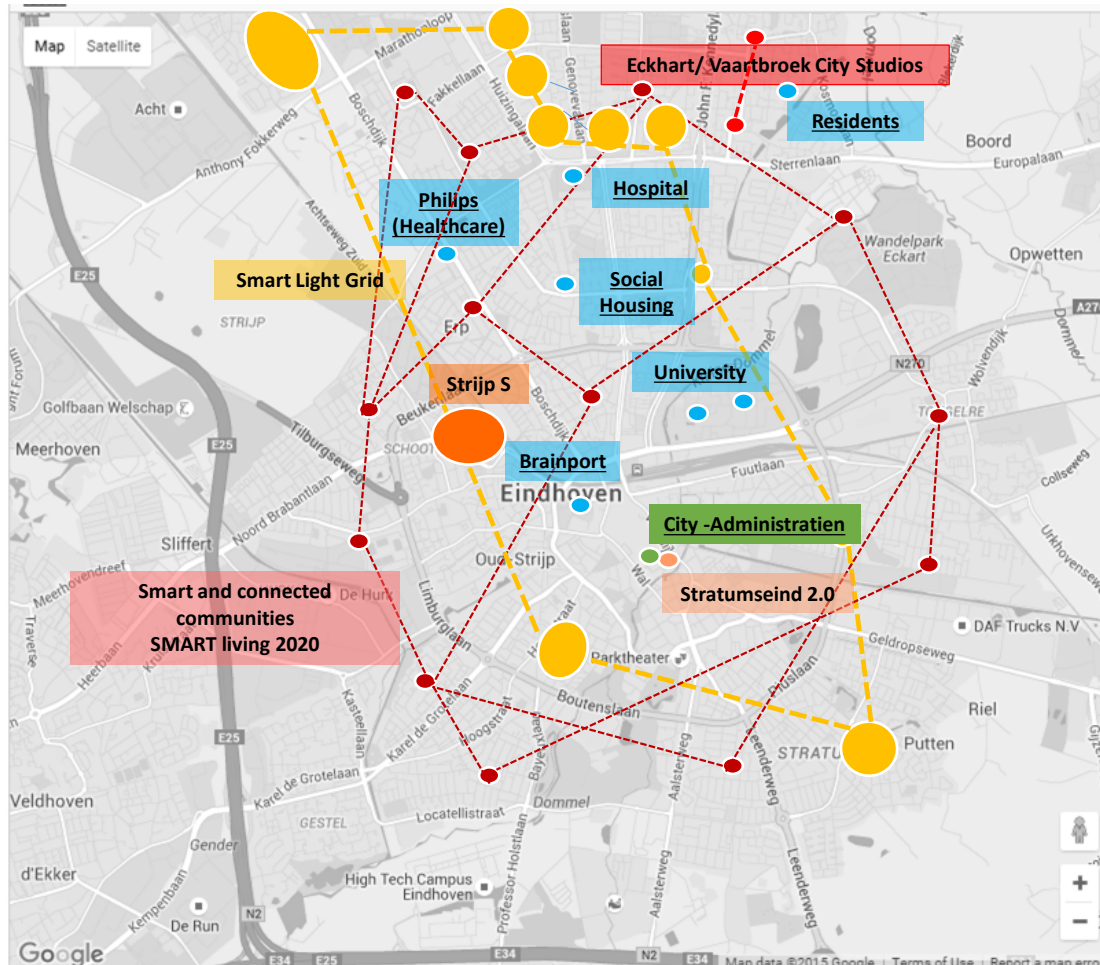
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4.2.3 Spatial map

Map 1 (in section 4.1) shows all the living lab initiatives in a map of the city of Eindhoven. This section zooms in on the spatial development of the living lab. The living lab in Eindhoven is an example of a city wide and city based approach: it is not a laboratory project, but takes place in the real and actual city and that respond to actual challenges in the city. This report zooms into 2 spaces in the city that have been subject to the living lab approach: Eckart Vaartbroek and Stratumseind. But actually all initiatives have a direct relation with space: they all relate to a challenge in the city, this challenge has economic and social dimensions, but also environmental and spatial ones. The reality illustrates this: in Eindhoven there are several area coordinators who form the link between the municipality and the citizens in a specific area and who have knowledge about social, economic, environmental and physical-spatial characteristics of the area (Eindhoven, 2016), for this research one of those coordinators was interviewed. Then, in the living lab project in the street 'Stratumseind', it can be observed that some bars are deteriorating and this physical neglect of the street is part of a vicious circle (interview Respondent 1, 8 October 2015). Additionally one of the respondents mentioned that the city is also a place for physical locations where people can meet each other including neighbourhood centres and schools (interview Respondent 4 6 January 2016). Other examples of initiatives are about mobility, lighting and health. Also in those initiatives it is important to understand *where* things are challenging (locations) and what kind of characteristics of those places (a more qualitative dimension of space) relate to the challenges. In strategies to overcome the challenges the question of *where* to intervene and what kind of quality to add to certain places is again critical.

Map 2 is the result of a quick scan and aims to show where several initiatives are based. It also illustrates the many layers that the city has. It shows that many activities happen in each other's vicinity. It is however not so precise and profound that it helps to really understand how the living lab initiative has developed in space.

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Eindhoven Living Lab Initiatives

● A number of initiatives are bundled and labeled as living lab

● A variety of local actors collaborate in the various LL activities

● Eindhoven City Administration is the coordinator of LL activities

Map 2: Eindhoven Living Lab initiative, co-existence and connections
Sources: construct of researcher, based on various sources, see reference list

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Map 2 shows the following:

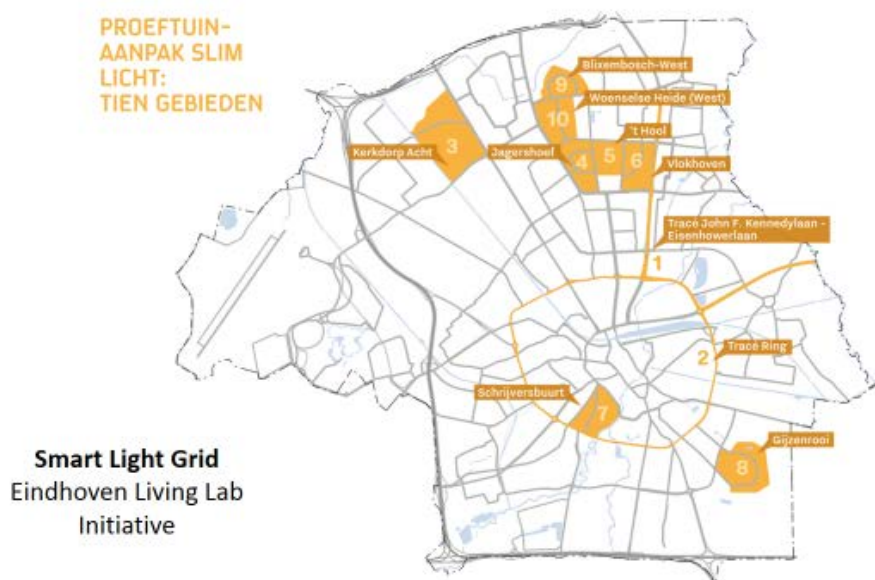
1) The **various LL initiatives** that together form the Eindhoven Living Lab – in red, orange, yellow; which are:

- The Smart Light Grid; a number of neighbourhoods will get new ‘smart’ lighting which is part of a general neighbourhood improvement strategy; the neighbourhoods are connected with and learn from each other (dotted lines)
- Smart and connected communities – Smart living 2020- initiative to improve health care by using technology to connect residents to care provided - dotted lines indicates connections
- Stratumseind 2.0- experimenting with light to reduce aggression -
- Strijp S – accelerator for creativity and culture that hosts a place for living and working
- Eckart Vaartbroek City Studios²- dotted lines indicates various connected initiatives- spaces for meeting local communities; see map 4

2) The **main stakeholders in the LL initiatives**– blue and green dots

- City Administration is initiator of ELL
- Brainport is accelerator for innovation
- Philips is important stakeholder in terms of light and health care technology
- Hospital is major actor in terms of health care LL activities
- Social Housing agency support neighbourhood development initiatives
- Residents support local community initiatives
- University is important knowledge provider/ research partner

One of the initiatives mentioned in map 2 is the Smart Light Grid. This initiative is a project that has light as its entry point (improving) the lighting situation in selected sites, but it goes further



Translation: Testing ground for Smart Lighting: 10 sites– The map indicates the location and gives the name of all the 10 sites; 1 and 2 are parts of a route; the lighting is not good in those routes and will be improved; nr 3 -10 are the names of neighbourhoods

Map 3: Smart Light Grid, Eindhoven Living Lab initiative
Source: Eindhoven, 2015

^{2 2} City Studios are described on the ENoLL website as: “(..) physical meeting places in the city where citizens are challenged to discuss about the challenges within their district, and where exchanges with potential suppliers offering/developing solutions to the problem posed are organised. The City facilitates this process and engages itself to (co-)implement the solution commonly defined. (ENoLL.eu, 2014)”

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than that and aims to improve the full liveability of those sites. Map 3 gives an overview of the various sites that are being addressed in this living lab initiative.

4.2.4 Zooming in on Stratumseind 2.0 and Eckart Vaartbroek

This section describes the initiatives in Stratumseind and in Eckart Vaartbroek in some more detail. The examples shows the diversity of the various living lab initiatives in Eindhoven.

Stratumseind 2.0

Stratumseind is a street in the city of Eindhoven, but it is special since it has mainly pubs, it has hundreds of meters of bars running like a ribbon through the city center (Brainport.nl, 2015d). Stratumseind 2.0 is a project in this area. It is labelled as a 'Living Lab' since it is a unique arena for research and experimentation. It is measuring many aspects of human behaviour and it intends to make nightlife safer, more vibrant and attractive. One of the most striking features of this Living Lab is the application of light. Philips and Eindhoven Technical University experiment to see if they affect the behaviour and the atmosphere in the 250-meter long street, with variations in colour and light intensity. The Brainport Eindhoven Region is the first City in the world that carries out such research in the public space. The lab is using sensors, cameras and other instruments that collected data in a manner that it remains public and that it will respect privacy sensitivity. Other influential data such as weather, noise, number of visitors, messages on Twitter and Facebook and the occupancy of car parks will also be collected and analysed, virtually everything in real time. It is even possible to trace the origin of the visitors (in a non-personalized manner) using data of telecom providers such as Vodafone (Brainport.nl, 2015d).



Picture: project leader Stratumseind 2.0, working with real-time data
Source: Brainport, 2015d

The mission of the project has been approved by the City Council: “Together with all partners, as entrepreneurs, breweries, property owners, police, City Council, we will structurally improve and increase the economic and social functioning and activities on the Stratumseind. This structural

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improvement will have three main themes: Safety, Liveability and Attractiveness.” (Eindhoven, 2015).

The project Stratumseind 2.0 is located in the street ‘Stratumseind’ itself, in one of the bars there is a small office with screens and processors for the collection and analysis of the data.

The Living Lab initiative Stratumseind 2.0 is an example of an initiative that has been developed with the idea: we will start and we will see what happens. This resulted in lessons that are used later initiatives, as to build on this experience (interview Respondent 3, 1 December 2015). The Living Lab in Eindhoven is also a clear example of a project that is fuelled by a strong individual. The project leader, Respondent 1 initiated the project, based on a strong personal motivation. He is passionate about and experienced in managing crowds (crowd management). He observes that the world is changing fast and that the role of technology and data becomes increasingly dominant and prominent. He thinks it is important not to simply look at and possibly criticize such development, but rather to become part of this change. He finds it important to experiment with and show the potential and the limitations and risks of using data technology. Additionally in a project like this, he hopes to reach young people and empower them (see also section on agency, including theory of change). His network, his passion and his mobilising capacity have resulted in the engagement of private sector and research and education institutions in the Stratumseind 2.0 project (interview Respondent 1, 8 October 2015). While this has not directly been mentioned in interviews, it seems that this project is very attractive for the image of Eindhoven. Respondent 1 mentioned that it is presented in many national and international events and it attracts visitors from all over the world.

Eckart Vaartbroek

Another living lab initiative is located in the North of Eindhoven, in the area Eckart-Vaartbroek. Where Stratumseind 2.0 is a clearly define project within the city of Eindhoven, Eckart-Vaartbroek is a neighbourhood with several initiatives that were not designed with the idea of the living lab in mind, but the initiatives rather emerged by self-organized actions of citizens.

There is no clear description in a policy document or online on a website that explains what the living lab in Eckart-Vaartbroek is exactly. However the city has mentioned the Eckart-Vaartbroek living lab in its yearly report that accompanies the justification of the expenditures of 2014, it there explains very basically what the living lab is about. The living lab is also mentioned in press releases (Eindhoven Press Releases, 2014, 2015) and formal writing from the local government confirms that the city has decided that Eckart Vaartbroek is a living lab (Eindhoven 2015b, 2015c), but that does not give much information on what the living lab is actually all about.

In the yearly report the following is mentioned about the Eckart-Vaartbroek living lab: “The city of Eindhoven is appointed as one of the Smart Cities in Europe via the Triangulum Consortium. In this context Strijp-S and Eckart-Vaartbroek will become real 'living labs' where newest technology in the field of energy, mobility and open data will be developed and implemented” (Eindhoven 2015e, p.12). The Triangulum project website says that two districts (Strijp-S and Eckart-Vaartbroek) will be transformed into sustainable living environments. In Eckart-Vaartbroek the project will be structured around energy-efficiency renovations of the social housing stock, in which the project

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will make use of IT-based modelling that helps to calculate costs and that also makes 3D visualisations of the potential changes to the houses (Triangulum-Project, 2015). One of the respondents also explained that the Triangulum Project and the product “Woonconnect”³ (which is the product of IT-modelling and 3D visualisation that was mentioned on the Triangulum website) are connected to the living lab in Eckart-Vaartbroek (Interview Respondent 3, 1 December 2015).

This description of the living labs is quite a bit different from the description of the initiative on the ENoLL website. There it is described as: “Eckart- Vaartbroek City Studios; The City Studios are physical meeting places in the city where citizens are challenged to discuss about the challenges within their district, and where exchanges with potential suppliers offering/developing solutions to the problem posed are organised. The City facilitates this process and engages itself to (co)implement the solution commonly defined” (ENoLL.eu, 2014). This interpretation seems more in-line with the interpretation of the area coordinator of what the living lab in Eckart-Vaartbroek is all about. He sees that the living lab has not yet materialised much on the ground in Eckart-Vaartbroek. It is now more a label that is used for innovative ideas that have not really come alive yet in the neighbourhood. For him it is more important to see the living lab in the context of a process that took place over the past years in which the municipality (including the area coordinator) and the social housing agency have invested in participatory urban development. Participation should be understood in a way that goes beyond our traditional understanding of relatively passive citizens that can have a say in a process in which the municipality and social housing agency take the lead. Rather he says, it is a process towards empowering citizens, giving them a platform to develop their own potentials, to come with initiatives and the municipality and social housing agency are enablers in this process. In this respect he considers two initiatives: the BIEB and Andromeda as good examples of the living lab approach. He said: “(..) we have explicitly acknowledged BIEB and Andromeda as kind of hooks in the context of shared ownership (sharing responsibilities between citizens and professionals in neighbourhood development, eds.). This is for example about social cohesion and it is done in self-management of citizens with professional support” (interview Respondent 5, 13 January 2016). The Social Housing agency and the municipality have facilitated the residents of the neighbourhood. Students of Fontys (*University of applied sciences*) helped the resident in the context of “Buurtwerkplaats Naoorlogs Woensel” (Neighbourhood workshop of the part of the city that is called Naoorlogs Woensel)” (Watwerktindewijk.nl, 2012).

The initiatives that were mentioned by the area coordinator are initiatives that emerged bottom-up, residents played a key role in those. The other, not yet fully implemented, ideas of energy-saving focus more on the application of technology and the idea comes from professionals, however, those initiatives also aim to engage citizens. The mapping below shows the implemented initiatives. But, as becomes clear from the description in this section, it should be acknowledged that this is not a complete picture of all the living lab initiatives in Eckart-Vaartbroek as this lab is still very much under development. It is also an interesting observation that the organically growing living lab in Eindhoven cannot be defined easy. The municipality is however aiming to improve the coherence among the initiatives as they recently appointed a Smart Cities programme manager who will also work on strengthening the living lab umbrella (interview Respondent 3, 1 December 2015).

³ See: <http://www.woonconnect.nl/>

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Eckart/ Vaartbroek City Studios
Eindhoven Living Lab Initiative

Example Initiative within
Eindhoven LL

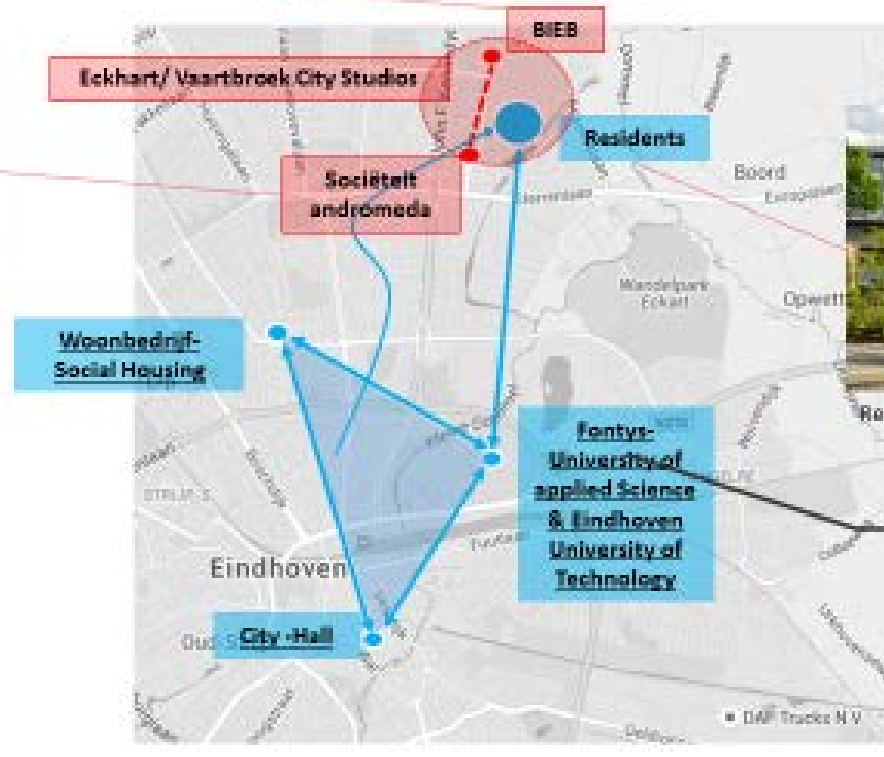


BIEB _ Residents develop an idea and implement it with social housing agency and city for a multi-functional physical space with :

- Residents run library
- Biological lunch
- Living room meeting place
- Information from City Administration and Social Housing Agency



Sociëteit Andromeda _
Residents and students develop an idea for a social meeting place for elderly people and the implement it with support from the city and social housing agency



Residents active in their neighbourhood

Actors based in the centre and the north of Eindhoven collaborate and link themselves to a group of organized residents, the university students establish a more intense collaboration with the residents in the Andromeda project

Map 4: City Studios Eckart-Vaartbroek
Source: own construct, based on various references

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4.3 TSI dynamics

4.3.1 Social context

This research focuses on social innovation and transformative change, the latter is defined as change that challenges, alters and/or replaces (dominant) institutions and structures in a specific social context. This section describes the interaction between the Eindhoven living lab and its social context. The social context is understood as:

- (other) actors, initiatives and networks
- established institutions and structures
- societal events and trends
- discourses and narratives of change
- social innovation clusters and field

The Eindhoven living lab and its relation with actors, initiatives and networks

As is mentioned in the timeline for the Eindhoven living lab, partnerships are very important for the city of Eindhoven and form the basis of the living lab, however the municipality is the main actor in the lab. In all interviews it is addressed that there is an interest to work with various partners and some respondents mention the desire to move from working in a triple helix (public sector, private sector and knowledge and educational institutions) towards a quadruple helix (adding the inclusion of citizens to the triple helix). The partnerships offer opportunities to establish a relationship with citizens, the private sector and knowledge and educational institutions and to focus on the challenges that they experience. Despite the achievements and the intentions, it remains challenging to truly engage with a diversity of actors and to truly address their needs. Many projects are not primarily motivated by the needs of citizens and this concern is expressed in various interviews: “I think that we often do the thinking *for* the citizen en then we develop nice projects, because there are opportunities, or because big companies are on board. But we still do not know if the neighbourhood is interested in such a project (...). Such projects are very intensive if you want to build trust and find out what the citizens really need” (interview Respondent 3, 1 December 2015). This view is shared by Respondent 5 who works directly with citizens and local entrepreneurs in the neighbourhood. He summarizes a big project in his neighbourhood as ‘a project about smart lighting with funding from Europe’. He is surprised that the project advocates co-creation but only funds technology (it does not fund process costs to engage with citizens). While many professionals in the project care about participation and engagement, it is clearly not the case for all of them as one of the project professionals is quoted by Respondent 5: “Don’t we simply know what we want? Aren’t we just interested in getting to know how we can make sure that the citizens follow our ideas?” In contrast to this the respondent believes that “It is the essence of the idea, if you want to work on co-creation, you do not know where you are going” (interview Respondent 5, 13 January 2016).

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Eindhoven is well connected to strategic actors in the field of data and technology and active in networks and well connected to them. The important relationship with the Eindhoven University of Technology, Philips and Brainport are already addressed in the sections on emergence. A loose selection of initiatives further illustrates the positioning that Eindhoven has in terms of technology, big and open data and smart city:

- Eindhoven has a partnership with 'het nieuwe instituut' (for architecture, design and e-culture) for the project 'de staat van Eindhoven' (the status of Eindhoven) which is about the smart city and citizens participation.
- Eindhoven developed the Code Fellows project with the Waag Society: three young programmers will work for 9 months for the city and they will get the freedom to develop solutions for socially relevant issues in the city of Eindhoven (interview Respondent 2, 14 October 2015, interview Respondent 3 1 December 2015, Waag.org, 2015).
- TRIANGULUM is an EU funded research programme with Eindhoven, Manchester and Stavanger about smart lighting,
- Eindhoven is finalist of the European Capital Innovation awards in 2016
- Eindhoven organises the Dutch design week on a yearly basis where national and international designers exhibit their work, this work includes, but is not limited to, digital applications and other smart technological design: <http://www.ddw.nl/en/>
- The organisation and hosting of events such as the 'Connected Futures' symposium in 2015 and the 'Beyond Data' symposium in 2016



Picture of the Code Fellows, with project leader Respondent 3 from Eindhoven municipality in the back
Source: Eindhoven, 2015, accessed on <https://www.waag.org/nl/blog/code-eindhoven-van-start>

Additionally Eindhoven is a member of the Knowledge Society Forum, which “supports cities to ensure that all citizens can have access to ICTs and participate in the information and knowledge society and helps public administrations to make the most of the rapid development of new technologies” (Eurocities.eu, 2015). Mary Ann Schreurs, the deputy mayor of Eindhoven and in charge of culture and innovation is the vice chair of this forum. Eindhoven is a leading actor in this network and a number of committed actors in this network are also part of the European Network

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of Living Labs and this network was the link between Eindhoven and ENoLL (interview Respondent 3, 1 December 2015).

Respondent 1 is a member of a steering group of Geonovum (interview Respondent 1, 8 October 2015), this group is linked to the Platform Making Sense for Society. Geonovum is an organisation that supports the government to work better with geo-information, they receive a base subsidy of the central government to fulfil this task. They are an important partner in the development of standards that can facilitate data exchange and they increase the awareness of government(al organisation)s about the potential of geo-information. Geonovum also started the Making Sense for Society platform which they present as a Living Lab focusing on the Internet of Everything. The steering committee that is linked to this initiative gives strategic direction and supports the process of formalization about the potential of sensor data for government (mainly the smart city) that is about technology (e.g. acquisition, storage and transmission) but also about policy, governance and privacy (Geonovum.nl, 2016).

The Eindhoven living lab interacting with established institutions and structures

The Eindhoven living lab has a rather harmonious relationship with existing and established institutions and structures. It does aim for doing this in another manner, but it does not do so by trying to replace or abolish the established institutions and structures. It rather creates an alternative way of doing things that can co-exist with the establishment and that might, in the long-run have the impact that the establishment will change.

One of the core characteristics of the living lab is the focus on collaboration as is explained above in more detail. The focus on collaboration respects existing institutions and structures, but it also creates new ones, new partnerships and new platforms. Respondent 4 explains the living lab as an approach in which people work together and collaborate and she argues that this implies a stronger focus on organizing oneself at a small scale level, in which collectiveness is important and she also says that “traditions are the new innovations” (interview Respondent 4, 6 January 2016). This encourages a social system in which citizens, but also entrepreneurs become less dependent on the existing (public) institutions and structures. She sees that the living lab as a vehicle that is about supporting this process of change. But in the other hand, she also addresses the importance of the ‘big’, established institutions and structures such as hospitals and doctors and she does not believe that this big system where we use and need money and go to the supermarket, will change.

The living lab in Eindhoven embraces technological change and the use of data and social media. This can also lead to conditions that challenge the existing institutions and structures. The municipality has a traditional way of dealing with citizens and some citizens are very capable of organizing themselves and very well aware of the processes and procedures and they can find their way in the municipal system (e.g. for getting subsidies, influencing policy or for getting other forms of support). Respondents expressed hope that the citizens can now use other means for self-organization and social media and that this should change (and improve) the relationship between citizens and public sector. This is however partly true as Respondent 3 expresses: “In the old days, the one with the loudest voice was the first to talk with the mayor, but you also see this online, the one with most followers and who can mobilise easiest also is the one to get in first. If I only have one follower on twitter, I can shout as much as I want, the mayor won’t listen” (interview Respondent 3, 1 December 2015).

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Then, the living lab implies that there are new activities (new ways of *doing*) and as consequence there are also legal vacuums, in other words, there is often no (appropriate) legislation to support the activities (interview Respondent 1, 8 October 2015, Respondent 2, 14 October 2015, Respondent 3 1 December 2015). In the Stratumseind 2.0 initiative they are 'leading' in addressing this dimension of experimentation with big and open data, there is a partnership with the Tilburg Institute of Law and Technology of the Tilburg University to make sure that this is addressed (interview with Respondent 1, 8 October 2015). This shows that the existing legal context, actually the existing *laws*, are being challenged. And to take it even a step further, the 'old' legal *system* might even not be appropriate anymore as it might not be possible to adapt laws fast enough given the speed of the technological development.

The Eindhoven living lab and societal events and trends

The living lab in Eindhoven is clearly a response to recent societal events and trends. Various actors and agencies identify trends and it is outside the scope of this research to study what significant trends exist in detail. Instead, this section presents a selection of popularly communicated trends. The first selection appeared in the Forbes online magazine in 2014, the year that Eindhoven joined ENoLL:

1. Connectivity and Convergence:
2. "Bricks and Clicks" (retail combines online shopping with physical locations)
3. Future of Mobility: integration with intelligent and smart technologies
4. Urbanization – City as a Customer: Cities will gain importance over nation states.
5. Social Trends Changing: Changing relations and interactions between actors and deep socioeconomic changes.
6. Health, Wellness and Well-being: Focus on prevention, the mind, body and soul.
7. "Innovating to Zero" is about bringing social innovation to forefront and about cars with zero emissions, zero accidents and zero fatalities.
8. Smart is the New Green: "Green" remains important but shifts to "smart" - intelligent, connected, ability to sense, process, report, and take corrective action.
9. Value for Many: new business model
10. Future of Energy: Environment friendly, Smart Grid and future 'Energy Internet'.
(Forbes.com, 2014, see Annex: Trends with some more details).

In addition to this overview of Forbes, the Utrecht (Netherlands) based Agency Trends Active identifies the following societal trends (and gives lectures about the topics) which they specify by keywords:

- Complex world (Keywords: desperation marketing/ honesty/ inertia/ low vs. high costs/ transparency/ trust/ uncertain times)
- Visual Culture (Keywords: hidden communication / semiotics/ societal trend/ subvertising/ visual culture/ visual learning)
- Connected Society (Keywords: future of social networks/ instant gratification/ location-based social networking / online identity)
- Health to happiness (Keywords: continuous partial attention/ health confusion/ health wellness happiness/ human contact/ new spiritualism)

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- Power of play (Keywords: distracted/ game principles/ gamification/ intrinsic motivation/ play/ rewards)
- Abundance (Keywords: abundance/ busy/ choices/ filter/ information/ overwhelmed/ products/ simplicity)

While the list of trends offer a view on the *future*, it mainly shows what we think about the future *currently*: what are considered to be the most important developments that will become dominant in the future? Most of the trends focus on networks, data, technology, new business models and new relationships between public, private and community actors. This is very much in line with the core focus, activities and values of the living lab. In addition Eindhoven is capitalizing on the trend of increasing use of social media as is well-linked to the idea of the connected society. It also explicitly embraces the idea that we need experimentation in order to be creative and flexible so we can deal with the current challenges. This is much in line with seeing the world as increasingly complex.

A reflection on such trends within the social context and the interaction it has with the innovations comes from one of the respondents who argues that we need certain processes of self-correction in our society. In terms of data and data use there was unrest in the Netherlands when ING (a bank) made public that they would share information about the behaviour of pin-transactions (electronic payments in shops) of its customers. Respondent 1 thinks that such unrest is an important form of such self-correction, but he also thinks it should go a step further since he believes there is so much happening on Facebook that people actually do not want (interview Respondent 1, 8 October 2015).

The Eindhoven living lab and discourses and narratives of change

The Eindhoven initiatives are part of what one could label as the 'co-discourse' as they address: co-innovation, co-design, co-development, co-pioneering, co-production. Those words are mainly used to address that a living lab is about doing things together, with partners. A very important term that is related to this is the helix. In the text on the ENoLL website the words triple and quadruple helix are used, Brainport mentions triple and multi helix and the coalition agreement mentions the word triple helix. Also some respondents use the terminology of the helix (interview Respondent 3, 1st of December 2015, Respondent 1, 8 October 2015), while the others address the importance of partnerships and cooperation without using those terms. Even though all respondents agreed about the importance of cooperation, of sharing and of partnerships, there seem to be different assessments of how successful the approach is implemented in practice.

But the narrative of change that dominates in the living lab in Eindhoven is about more than cooperation. It is about connection at various levels: connection of people, connection of data and technology and the connection of different worlds. An important focus of connection is connecting the world of technology with the issues, needs and challenges that people experience in their daily lives. This is considered also to be the real challenge. As Respondent 3 addressed it: "It is about how you organize it, that is the more difficult than ICT. Okay, we find out that we also have to

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connect the systems and we need infrastructure, but I think that that is the least difficult part, it is harder to get all the parties work together and then also get the citizen involved. That makes it... exciting" (interview Respondent 3, 1 December).

As is also addressed in the section on emergence, Eindhoven is a city of Technology. The importance of technology is expressed in the use of words and concepts such as Internet of Things (or Internet of Everything); SMART (city); Big Data and Open Data; Sensors; applications and networks. Eindhoven hosted the Connected Future conference in November 2015 and there those words were also very at the heart of the discussion. There is a strong believe in the importance and potential of technology within the Eindhoven living lab, but there is also the awareness that technology cannot solve everything and that it has its limitations. Not everybody wants to see the limitations of technology however and this can lead to a naive interpretation of its usefulness. As Respondent 1 illustrated with an example that he drew from one of the Dutch police academies that he visited. Professionals in this academy argued that they can analyse social media and that they can see where things will go wrong based on the analysis of social media. Kanters does not believe this, there is quite a lot of 'data pollution' on social media. E.g. when you look for messages about the bar Costa it is very hard to filter out all the messages that are actually about football player Da Costa. He is also critical that some big companies such as Microsoft, IBM and Cisco paint pictures that are too optimistic. Technology and data can help us, but they cannot solve all our problems (interview Respondent 1, 8 October 2015).

Finally, the focus on cooperation, connection and technology is complemented with a dimension of developing new ideas and of being solution-driven. The words design, creativity, innovation, but also experiment are used on the city website news items, in the coalition agreement and in the Brainport policy to characterize the processes that take place in the city of Eindhoven, including the living lab (Brainport 2015, Eindhoven 2014, Eindhoven 2015 a,b,c,d,e). In the next section on Agency and theory of change it is further explained how this materializes in understanding the process of change in society.

To conclude the Brainport website gives a nice illustration to the background to this narrative of change: "(..) High-tech and design go hand in hand with top-quality manufacturing and entrepreneurship. All of which enables us to accelerate growth: economically, socially and individually. Growth in wellbeing and prosperity, that is what drives us forward. It is an ambition that requires getting the right connections in place. Between business, government and research and education – the Triple Helix. Between sectors, within the chain and with other strong economic regions. Connections – that is our strength. Synergy is created where high-tech meets the challenges in Health, Energy, Mobility, Automotive, Food and other areas. (..)

In the interplay that develops between the different collaborative partnerships, something special happens. Like the synergy witnessed in nature when a flock of birds comes together and moves. The intelligence of the flock ensures not only that the movement of every bird is optimised but also that the flock itself is greater than the sum of its parts. The flock acts as a large magnet and brings everything together, making the collective intelligent, manoeuvrable and effective. And this is what characterises Brainport, too. Collaboration and cooperation, a considerable dose of intelligence and the ability to constantly adapt help accelerate the economy and get the individual moving, and proves a powerful magnet for attracting talented students, knowledge workers, entrepreneurs and investors from around the world. (..). (Brainport.nl, 2015 a)"

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The Eindhoven living lab and its relation with social innovation clusters

As mentioned, Eindhoven is well connected to other networks and that connection also expresses its positioning and relation with social innovation clusters. Eindhoven is part of a bigger field or cluster of innovation that can be best described as the broader living lab cluster as well as the smart city cluster. Living labs and smart cities are also two connected clusters.

The membership of ENoLL is an important signal to its commitment to the ideology of living labs and the fact that Eindhoven recently appointed a programme manager Smart Cities who is also committed to increase the connections between the various living lab initiatives illustrates the intertwining of the two clusters.

4.3.2 Values and characteristics of the living lab

The social context interacts with the living lab initiatives. Something that is related to understanding the social context are (the dominant) values in society. Those values influence for example the trends and narratives of change in a society and vice versa. But the values also interplay with the living lab initiative. This section addresses important values that are relevant for understanding the social context and that were brought forward by the respondents in the interviews and that play a role in shaping the characteristics of the living lab.

Dynamics and experimentation in open-ended processes: towards a new system

Doing is an important credo in the living lab and in Eindhoven in general as it offers ground for **experimentation** (interview Respondent 1, 8 October 2015). **Dynamism** is part of an experimental process and it implies that you do not know what comes and it requires that you can deal with **disappointments**, making mistakes is part of this process and also a measure of success since you are then working on an exclusion process (finding out what should not be part of your development) done by trial and error (interview Respondent 4, 6 January 2016)

One of the respondents sees the notion of an '**old system**' and a '**new system**'. The old system can be characterised by privatisation (focus on the market/ private sector) and individualisation in which established institutions decide what is good for you, while the new system is about deciding for yourself, but also it has a **communal dimension** and it is about **reciprocity**, counting on and caring for each other. "When we develop our society with social engineering and define how and where all the lines are, people get entangled or lost in the labyrinth of the structures" while a new form of innovating fits better in chaos, where a eventually everybody can find his or her way (interview Respondent 4, 6 January 2016)

It is very important to be able to **truly cooperate** between companies, government and educational institutions, that means focusing on a joint outcome and letting go of your ego (interview Respondent 4 6 January 2016). Cooperation is also important in **learning** processes. If you want to learn from networking events, one should be prepared, you need to know what you

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want to get out of it and what you can offer. This preparation needs to be done by a team of people (interview Respondent 3, 1 December 2015).

It takes **time** to develop 'a **new democracy**', an important initiative that operationalizes this process is G1000, 1000 inhabitants of Eindhoven are selected at random to start a dialogue in 1 day with the aim to put things on the agenda of the city, the day should take place on May 26th in 2016 (interview Respondent 4, 6 January 2016; G1000Eindhoven.nl, 2016). It is remarkable that even in such an initiative there is a desire to include politicians and civil servants, it means that the 'old system' is invited to join in a 'new system' (interview Respondent 4, 6 January 2016).

It also takes time to start **working differently** as municipal staff. The Eindhoven municipality has been reorganised 2 years ago and since then there is a strong emphasis on working from the 'outside-in'. In other words, focus on what happens in the city and try to move along with that as municipality, rather than developing inflexible policy that cannot be adapted. In practice this is very hard since most people who work at the municipality think about sectors, about their own agenda and it will require much effort and mainly time (decades) before they will think and act differently (interview Respondent 5, 13 January 2016).

You see that many people **fear to do things differently**, there is a fear to let go of what one already knows (interview Respondent 3, 1 December 2015 and interview Respondent 4, 6 January 2016).

This implies that we need to create a **safe environment** with **trust, mutual respect** and at least some **guiding principles**. It also requires a motherly type of care and stimulation from at least some employees of the municipality. Those employees should learn to look from some distance how people (citizens and professionals) in the city experiment, and when something goes wrong, they should be there, for "putting a plaster on a wound, to give a kiss and to say, 'come on, go on, you can do it'" (interview Respondent 4, 6 January 2016).

Eindhoven might be the only city that says in its coalition agreement⁴ that **there should be room for failure, for making mistakes** (interview Respondent 4, 6 January 2016) and that this room exists is confirmed by other respondents (interview Respondent 2, 14 October 2015; interview Respondent 3, 1 December 2015). When you make mistakes you learn most, so this space is really critical in making a living lab successful (interview Respondent 3, 1 December 2015). The example of the code fellows project is an example of a project where there is room for making mistakes (interview Respondent 2, 14 October 2015). Also in Stratumseind things go wrong, material (phones, camera's, and wires) broke down for example, and then the project team learned how and for what they should be more careful in the future (interview Respondent 1, 8 October 2015).

Despite such developments, not everybody experiences a culture in which there is indeed room for making mistakes, even if the culture seems to be changing towards this in some respects (interview Respondent 5, 13 January 2016).

It is important that people engaged in living lab initiatives are **open-minded** and in Eindhoven they are. A living lab also attracts the frontrunners who enjoy experimentation and who look for innovation. Besides there is support from open-minded local politicians in Eindhoven (interview Respondent 3, 1 December 2015).

Being a **frontrunner** can be a **lonely position**, since you will constantly meet resistance of others. An example of resistance were the (at first hand) negative reactions on the idea that the municipality should start using social media (interview Respondent 3, 1 December 2015). A way to make it easier for frontrunners is to look for alliances among colleagues (interview Respondent 1, 8 October 2015, interview Respondent 3, 1 December 2015). And in the municipality civil servants can also use the support of forward looking politicians. Another important lesson is that it is not

⁴ See section 4.1 that explain the living lab initiative in which this room for experimentation and making mistakes is acknowledged

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useful to push constantly, in order to overcome resistance it is often needed to slow down the process and take time and give room for the emotion and arguments of others (interview Respondent 3, 1 December 2015). Respondent 5 shows another side of the coin and argues that it should also be possible to stop with plans if there is no support from the citizens. In some cases the professionals come up with great ideas for a neighbourhood, but they do not ask if there is a real interest for this innovation in this neighbourhood. In practice, this might be 'not done' as it can be associated with failure (interview Respondent 5, 13 January 2016).

As a municipality **Eindhoven** is often described as **frontrunner**, particularly when it comes to **technology** and the use of **data** (interview Respondent 2, 14 October 2015). However, this is not a very easy term, there are more cities who would call themselves frontrunners. Being a frontrunner also has **disadvantages** (interview Respondent 2, 14 October 2015) and it has risks, "it is important in a living lab and open data project that you are not running in the first position by yourself, but that you start walking together with others, otherwise you only give knowledge to others and you get little in return" others (interview Respondent 3, 1 December 2015).

When you are working in an innovative setting you also have to think about **potential consequences**. This implies that you need to look beyond your own project and avoid oversimplification. For example, privacy is not an easy concept. We might be able to safeguard privacy for the use of one set of data by making sure that the data that is available is non-personalized. But there might be other applications and combinations that put this data in another light. To illustrate this: if we know how much pizza is sold somewhere, but if we cannot say who bought it you might think that privacy is respected. However, if a health insurance organisation uses that data to determine the life style of a certain neighbourhood, it might have negative consequences for citizens (interview Respondent 1, 8 October 2015).

The **experimental nature** of the living lab is **sometimes conflicting with the role** of being a **public authority** (interview Respondent 5, 13 January 2016). This can be explained by looking at the responsibility of the municipality for e.g. delivering public services, local legislation, creating a form of security and protection for its citizens. It is important and relevant that the municipality supports new and innovative ideas to tackle current challenges, and it is fine that this leads to exiting situations every now and then, but it is in the end a public authority with responsibilities towards its citizens and not an entrepreneur or innovator.

Citizens first, but hand in hand with technology, and data

There is interest **to increase the self-reliance and autonomy** of people within their own community. This is also a trend in society with examples such as urban-gardening and producing your own (sustainable) energy (interview Respondent 4, 6 January 2016). In line with this ideology, the goals of the Andromeda initiative (part of the Eckart-Vaartbroek initiative) are to stimulate social cohesion, self-reliance, community building, a useful way to spend free time/leisure, to reduce loneliness, to stimulate ownership and to activate the organisation of activities (watwerktindewijk.nl, 2012).

It is important that **people** (aiming to improve their situation) **are the main focus of all the things that a city does** (interview Respondent 3, 1 December 2015). If you develop technology this needs to go hand in hand with finding applications for it and that can only be done if you are constantly interacting with citizens and businesses (interview Respondent 2, 14 October 2015).

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Making sure that thinking about the citizens comes first, includes citizen **participation** and it goes beyond giving citizens a role in consultation processes. It is about **empowerment** of citizens (interview Respondent 3, 1 December 2015, Respondent 4, 6 January 2016, Respondent 5, 13 January 2016). A living lab should also **connect various actors** with each other. The connections between various actors do not always need to be planned or steered, spontaneous encounters between actors can lead to interesting ideas and initiatives (interview Respondent 5, 13 January 2016). An example of an initiative that aims to empower citizens is the initiative of BIEB Dommelbeemd in Eckart-Vaartbroek. It gives citizens the possibility to co-decide on the priorities of the neighbourhood watch, who is employed by the municipality to reduce nuisance in the neighbourhood. The call is published in the neighbourhood newsletter prepared by citizen's initiative BIEB Dommelbeemd and a number of public, semi-public and private partners. It is however still a challenge if this approach manages to reach the citizens that are not already empowered.

Transparency and openness are very important for the success and sustainability of the living lab (interview Respondent 3, 1 December 2015, speech of Vice Mayor Mary-Ann Schreurs' at Connected Future 2015). This has resulted in the standpoint of Eindhoven that all data that is produced and collected in public space, also belongs to the public (interview Respondent 1, 8 October 2015, Respondent 2, 14 October 2015 and Respondent 3, 1 December 2015).

In order to make sure that innovation and experimentations takes off a certain critical mass needs to believe in it and support it (interview Respondent 3, 1 December 2015).

The (local) **government has a responsibility to support innovation**, by giving subsidies, by facilitating cooperation and by offering other forms of support such as cheap locations to work, adapting local legislation to make new technological applications possible, but also to reduce (potential) harm of it (interview Respondent 2, 14 October 2015)

If we work with **big data, privacy** is critical. From the beginning of each initiative we should focus on safeguarding issues around privacy. "The current legislation around this topic is absolutely not sufficient (interview Respondent 1, 8 October 2015)".

4.4 Agency in (T)SI

In TRANSIT we are interested to learn how social innovations emerge, how they interact with the social context in which they emerge, but also, to what extent they empower or disempower initiatives. The latter is expressed in more detail by looking at the role of agency. Agency is focused on the human dimension of change: how do people within organisations, initiatives, projects, networks etc. relate to the change that they are working for? Do they have influence and direction over their circumstances, are they working on change that is in-line with their personal motivations? What do they believe in? But also, what helps them in this process (within TRANSIT there is a specific focus on the role that Governance, Social Learning, Resources, Monitoring and Evaluation play in this process)?

Subsequently, the chapter on Agency is subdivide in 4 sections that address the following topics, the sections are based on the interviews:

- ✓ Personal motivation: why are the people that are active in the living lab motivated to do so?
- ✓ Theory of change: how do the people that are active in the living lab understand processes of change? How do they see that their work and they themselves contribute to it?

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- ✓ Empowerment: who is empowered by the living lab initiative, how does this work, what is the meaning of this (dis)empowerment process?
- ✓ Governance and Resources: how do those elements interact with agency and empowerment? Are they enabling or inhibiting?

4.4.1 Personal motivations for the living lab

This section summarizes the personal motivations of the different respondents in this research:

Respondent 4 has a passion for the city of Eindhoven and for being active in this city. She has always participated in think tanks as a citizen. Now she is a local politician and of course still a citizen of Eindhoven and she still has the same passion. Both as citizen and as politician she is motivated to engage in small-scale processes focusing on the human dimension, rather than organizing all social processes in big structures and institutions. In the living lab the people should also be the entry point, this is my motivation. It is motivating to enable people and allow them to follow their heart and to develop ideas into action. This makes the work dynamic and with unpredictable outcomes, that is hard, but that also gives it glory and makes it exciting (interview Respondent 4, 6 January 2016).

Respondent 3 enjoys the dynamic character of the living lab work: “I personally like to try out new things and to experiment, I am a frontrunner and I can see where the innovation takes place”. Furthermore she is motivated to focus on people, she likes to experiment with the use of technology, data and social media, but people are always the entry point (interview Respondent 3, 1 December 2015).

The City of Eindhoven is a motivating city to work for Respondent 2. She did not grow up in Eindhoven, but she has studied in Eindhoven and she got to know it as a city where you can really work on change. It is a city that embraces innovation, technology, culture and creativity and it has a culture of strong cooperation. It is motivating to be part of this process in such a change-oriented city. She is very much interested in ICT and the role that data can play in society and that is very important in and much related to the living lab work (interview Respondent 2, 14 October 2015).

Respondent 5 believes in the strength of the individuals that live in cities. He thinks that change can start very small and that very small changes can be really important. It motivates him to give people a voice in the city, but mostly to contribute to processes of personal change that also help the neighbourhood. An example that he gives is that he had contact with a woman in the neighbourhood where he works, he aimed to help her to develop an initiative that she could not get off the ground. He gave support, some contacts and asked reflective questions and she was inspired by it. She later shared that she learned to use a different perspective in her endeavours and that she now manages to engage with many of her neighbours (to some of whom she felt distant beforehand) and jointly invest in a better street with a nice garden (interview Respondent 5, 13 January 2016).

Respondent 1 is born and raised in Eindhoven. He worked in the city for years in the field of crowd management for big events, mostly for the Eindhoven based rock festival ‘Dynamo Open Air’. He is very much interested in: “networks of people who can support each other, who can keep each

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other with their feet on the ground. To festivals this applies literally, to society it applies metaphorically.” He observed a societal change, where the role of data and technology are increasing and he sees that this change brings both risks and opportunities. He is motivated to become an active shaper in this new world, rather than a passive observer. He started to work for the municipality 15 years ago and initiated the living lab in Stratumseind 2.5 years ago. In this initiative he can combine his desire to take an active role in the process of increased use of data and technology and to combine this with his passion for and experience in crowd management (interview Respondent 1, 8 October 2015).

4.4.2 Theory of change

There is no shared theory of change among the living lab in Eindhoven, even though this is something that most probably will be invested in in the near future point (interview Respondent 3, 1 December 2015). However, within the city of Eindhoven there is a credo that has been developed that should summarize the most important values underlying various actions in the city. In Dutch it is “Dichtbij, Durven, Doen” which can be translated as “Near, Daring and Doing” and it is about focusing on a) being close to citizens, being concerned about local issue and being connected and committed to the city of Eindhoven, b) on being brave to do things differently if needed and C0 on acting rather than talking. Those values were brought forward by two respondents (interview Respondent 1, 8 October 2015 and Respondent 3, 1 December 2015) and also inspired the living lab.

As an important spokeswoman for the city, Mary-Ann Schreurs, the vice mayor of innovation in Eindhoven posted opening words for the Connected Future conference and she emphasized the importance of openness, in relation to data, but also in a broader context. She said: a new future can only be based on openness and she actually included openness as a condition for the change that we need in our society. The importance of openness in relation to data is also addressed in interviews (interview Respondent 1, 8 October 2015 and Respondent 3, 1 December 2015) as well as the importance to be transparent and honest in your way you support citizens and their initiatives (interview Respondent 5, 13 January 2016, Respondent 4, 6 January 2016).

A number of respondents addressed the importance of big data, for now and mainly for the future. But there is also caution since it can be abused. Respondent 1 therefore clearly indicated that he prefers to be in the driver seat himself, being on top of the developments. For him this is a theory of change: being active to be able to influence change. He feels the freedom and autonomy to do so as a civil servant in Eindhoven. Based on his experience in crowd management, he knows exactly when a situation (in social setting, many people) is going to explode, a few moments before it actually explodes. He wants to develop knowledge on how we can also measure this objectively by using data. And he also wants to show the limitation of data. If he can do this, he should be able to influence others (interview Respondent 1, 8 October 2015).

Change is a process that is never finished. Even if you consider change as a process that takes time, as addressed in the section values and characteristics under the chapter on Social Context, when you think it has materialized, it turns into something new. Respondent 2 understood how this literally

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shaped the city of Eindhoven. After working and living for some time in this city, she saw it was constantly being redeveloped, and she realised it is never will be finished (interview Respondent 2, 14 October 2015). The living labs is also an approach that never finishes, projects within it might end, but the logic of doing experiments gets part of the DNA of the city and then it keeps on mutating.

The personal level is also considered very important in the process of change. Respondent 4, addressed that we need people who are initiators and who can motivate others. This means you need people who are intrinsically motivated otherwise they will not be able to mobilise others and change will not happen (interview Respondent 4, 6 January 2016). Processes of change also need interventions of individuals. This varies from being aware of when you need to release pressure and not push for change to hard (interview Respondent 3, 1 December 2015) from knowing when it is important to be critical and confrontational and not simply accept the natural course of things (interview Respondent 5, 13 January 2016). Respondent 5 explains his theory of change as follows: many people start to get angry, or ask for things when they feel uncomfortable with their current situation. But there is usually a bigger or deeper question or ignorance behind this. It is important that we find out what the real motivations for change are and also that we start dialogues with each other so people learn why other people or organisations or institutions (e.g. the municipality) do certain things. If we manage to connect people, and to start dialogues, sometimes really at individual level, we will move a step forward in constructive processes of change (interview Respondent 5, 13 January 2016).

The website of Brainport shows another type of philosophy around change that is about attracting investment and technology. Even though it is not directly related to the living lab, it shows that not everything and everybody is mainly concerned about citizens, but that there is also a strong interest to and believe in engaging the private sector in processes of change: “We have pushed the envelope to become the beating heart of high-tech Europe, developing strong specialisation in fields like mechatronics, robotics and advanced materials. It is not a position we take for granted. We know we have to keep developing and innovating. In the coming years we need to attract well qualified people at all levels and it is crucial for us to keep and attract R&D. We also need more start-ups and fast-growing innovative companies and investors to enable these companies to take wing. To get these companies, investors, knowledge workers and technical people to settle in our region, we have to create a good business climate, innovative forms of collaboration and cooperation along with international connections. (..) Brainport Eindhoven has the best investment climate after London and Helsinki according to the Financial Times, which shows our potential. A top three spot signifies a tremendous jump for Eindhoven in the ranking, which is closely monitored by international investors. Never before has a Dutch city been so highly ranked in this list. Brainport will also make the difference in the future. (..) (Brainport.nl, 2015)”

4.4.3 Empowerment

This section addressed two main things with respect to empowerment:

- Who are actually (aimed to be) empowered in the living lab?

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- How does the living lab intend to increase the autonomy, self-reliance, trust and confidence of various actors including the citizens of Eindhoven?

As it is expressed already under the heading 'citizens first, but hand in hand with technology, and data' that is part of the section on values and characteristics in the former chapter, there is a strong desire to focus on and engage citizens in the living lab, but in practice it is hard to realise this.

Who are (dis)empowered?

It is difficult to engage everybody, living labs and other municipal initiatives. In interviews this risk is addressed by several respondents. The concern is that people with high educational levels are advantaged in terms of getting support for their initiatives. They understand the way the municipality works, they can relate to the language that is used by its professionals. This implies a risk that participation, particularly when it is understood as supporting self-organized initiatives, becomes something that is mainly accessible for the elite. Besides that, the municipality has a tendency to engage groups of citizens that they already know, the ones that they already support. It is important that a living lab is also reaching out to those citizens that do not know how to make use of the existing municipal support structures. Currently it has not yet developed a strong basis for doing so (interview Respondent 3, 1 December 2015; Respondent 4, 6 January 2016; Respondent 5, 13 January 2016).

But even among people who do manage to get their ideas in the spotlights there are examples of disempowering realities. Respondent 4 illustrates this with the notion that there are a variety of citizens, including professionals (e.g. social entrepreneurs) who come up with great ideas and initiatives and who start to develop this idea following their own values, ideals and intrinsic motivation. However, in practice their ideas often get hijacked, by (other) professionals with good commercial entrepreneurial skills. They use the idea and make money and fame with it, without the proper engagement, compensation and acknowledgement of the initiator (interview Respondent 4, 6 January 2016).

Then, the concept of the living lab and the smart city are getting much attention in some cities, but that does not mean that they relate to the majority of citizens in for example, the rest of the Netherlands. As Respondent 3 explains: "I live in a small village myself and there things like living labs and the smart city are not at all part of the discussion among the citizens" (interview Respondent 3, 1 December 2015).

The initiative of Stratumseind focuses on a street with active night life and this initiative mainly aims to empower the visitors, mainly young people. This project allows the municipality to contribute to community building. "We can make sure that the people who visit this street, the visitors of the bars, mostly young people, get some more responsibility". The idea behind this, is that "citizens get the opportunity to use everything that is available in terms of big data" and in that way it can empower citizens. In general we see a trend that more and data is openly and democratically accessible. However, data can also be controlled by a repressive government or by commercial companies (interview Respondent 1, 8 October 2015). In such situations data can also be disempowering.

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Increasing autonomy, self-reliance, trust and confidence

“Information is power, you can see this in the example of Stratumseind.” Possibly the initiative in Stratumseind can strengthen the position of the visitors and the residents. Information has an important function for this: as residents can now see how much noise is produced during the night and during events they tend to complain less and that might lead to a better position for the visitor and the resident (interview Respondent 3, 1 December 2015). Also the organisers of events are now ‘being monitored’ and tend to better stick to the rules. The information leads to less complaints (interview Respondent 1, 8 October 2015).

It is important that all citizens, and specifically young people start to understand the power of data. The living lab would like to contribute to a process of making citizens more conscious about this. To who belongs data? Many people now just click “I agree” when it comes to agreements for using data on e.g. facebook and they are then not aware that this means you give up part of your privacy since you allow other parties to use your data (interview Respondent 1, 8 October 2015; Respondent 3, 1 December 2015). This issue was also addressed during the Connected Futures conferences organised in November 2015 in Eindhoven.

So, in the living lab it is important to make people aware of limitations of privacy while using social media. But it also includes addressing the question which data belongs to whom. Data that is collected publicly should also be accessible to the public as is also explained under the heading ‘citizens first, but hand in hand with technology, and data’ that is part of the section on values and characteristics in the former chapter.

Empowerment is understood by the respondents as a process to find and release the strength that people have. Respondent 5 illustrates this as follows as he explains how people can be activated “in their own neighbourhood, their own street, their own block, to allow them to devote themselves to their fellow-citizens in their own block, their own street. I am convinced that people can do much more than they think, too often they are waiting for the institutions, the government, to do something, and they remain inactive, with a passive attitude” (interview Respondent 5, 13 January 2016). Respondent 1 takes this even a step further and argues that “citizens should say ‘we will survive politics, so we are not too much interested in what they do’, they really should not wait for them (...). I think you should organise it yourself as citizen” (interview Respondent 1, 8 October 2015).

But there are also good experiences, where citizens are gathered around an issue and support each other. It then becomes clear that citizens are more than just ‘local people’, they are people caring for others, they are engineers, they are sportsmen, etc. Actually ‘citizens’ are a diverse group and many of them can take care of themselves and also of others. But this does not mean that support is not important. To create a situation in which people are empowered is not easy. Based on his experience of working with citizens in the neighbourhood, Respondent 5 notices that there is always an important question or issue behind the first thing that somebody says, or asks for. It is important that governments do not react quickly and simply to the messages that get to them, they need to invest in finding out what there is behind it, otherwise they might do the wrong things eventually. This thus requires a governance approach that pays attention to personal skills of the civil servants and politicians: that the people who work in the government are capable of asking questions with a certain depth, confrontation and persistence, not settling too easy for any answer (interview Respondent 5, 13 January 2016).

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Empowerment also matters at the level of the people who are running or related to the living lab. All of the respondents felt they had at least a considerable (and sometimes a large) amount of freedom to focus on what they found important in their work in general including their work for the living lab.

4.4.4 Governance and Resources

Governance and resources are identified as factors that contribute to (dis)empowerment in the TRANSIT research. How this happens in the living lab is shortly addressed here.

Governance

Governance is about decision making and it is addressed as one of the most challenging components of the living lab in Eindhoven. How do you make cooperation between various actors happen and how do you make it constructive? This is also discussed in the section on social context and particularly the part ‘The Eindhoven living lab and its relation with actors, initiatives and networks’). This means there is a need to find out which governance arrangements will work in practice. Part of this process also deals with ownership and privacy (interview Respondent 3, 1 December 2015). This relates to the questions:

- Who can decide, what and when?
- Who can use what, when, where?
- Who owns what, when and where?

Those questions are particularly relevant in relation to data. The city of Eindhoven has decided that data produced in public space also belongs to the city, but what will this imply?(interview Respondent 1, 8 October 2015).

Big data offers opportunities for empowerment, but the role that government plays in this, is critical. Data can democratise the society, by increasing transparency, but the government can also use it in a repressive, controlling manner and use it to create a policing-state instead. “Our former minister of security commented that he would like to be able to push a button to switch of social media and that is obviously absurd” (interview Respondent 1, 8 October 2015). Respondent 1 expects that big data will become increasingly important in the next 5 to 10 years and he sees it as a Trojan Horse which can “either lead to a controlling government who puts a digital cage around all the data, or it can contribute to an enormous democratisation.” He expects and mostly hopes that the development in Europe is towards democratisation (interview Respondent 1, 8 October 2015).

The discussion about ‘data-governance’ is also relevant at neighbourhood level in Eckart-Vaartbroek, where the municipality cooperates with commercial partners. In this project data is produced and used, but there was not yet a clear vision and standpoint from the municipalities on the ownership of this data. The issue was addressed in an ad-hoc manner: experts jointly developed an approach for it, this happened under time pressure. As a municipality you notice that you enter in a process in which you do not exactly know what your role is and that is difficult (interview Respondent 5, 13 January 2016).

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There is national and local political discourse about increasing self-reliance (participation society) of citizens. Many citizens get annoyed by this, they constantly hear that they need to do things themselves, while in many cases they already do most things by themselves, but that is not always noticed (interview Respondent 5, 13 January 2016). This trend fits with the attempt that the city of Eindhoven aims to reduce its role and that it becomes more enabling. This shifting of roles has been addressed by all respondent and is also visible in the policy of the city (Eindhoven, 2014). Respondent 5 addressed that not everything goes well: decision making and action from government needs improvement. The case of the community centres illustrates that the local government is in some cases incapable of taking decisions and action effectively and efficiently. Traditionally there are community centres in many neighbourhoods in Dutch cities, as a consequence of budget cuts those centres are under much pressure. The municipality of Eindhoven has not been able to take clear and coherent decisions around those centres that are in line with the intended transitions and policy goals of empowerment and increasing the self-reliance of citizens (interview Respondent 5, 13 January 2016).

There is also a risk if one works with partners who do not know the neighbourhood, in such cases being connected with (the right) municipal staff is critical. An example is a project in the neighbourhood in which the Technical University of Eindhoven is engaged as project partner. They designed a questionnaire with many questions for information that was already known (the municipality also conducts statically sound questionnaires), while some of their questions needed to be more localised (e.g. asking whether citizens were familiar with certain initiatives in the neighbourhood, mentioning those initiatives by name) (interview Respondent 5, 13 January 2016).

Resources

One of the main conditions for getting an innovation of the ground are the access that you have to resources: money, time, manpower, etc. (interview Respondent 3, 1 December 2015). The resource base of the living lab has not yet stabilised and it now seems to rely quite heavily on municipal funding. This gives it a rather vulnerable position.

One of the respondents addressed that it could be interesting to explore if some things that are developed in the living labs are commercially viable. Meaning, that some products that are developed within the living lab could generate income at some stage of maturity, then the living lab could be a business model. Besides income (financial values) it should also generate societal value and we can also think of combining those, think about cost reductions for citizens for certain services. If you want to realise this you need investments, a business plan and a clear structure and that implies it would be less spontaneous and more boring, but that would then be the professionalization of the living lab (interview Respondent 2, 14 October 2015).

But besides funding there are other important resources that also are used in the living lab. The amount of volunteers that is active in the Netherlands is incredible and without them, the society would not function (interview Respondent 5, 13 January 2016). Additionally it is important to also explicitly see time as a resource. Change needs time (interview Respondent 4, 6 January 2016, Respondent 5, 13 January 2016) but developing action also needs time. Referring to the various initiatives in Eckart-Vaartbroek Respondent 5 says “One should also give time to partners to actually *do* things in another way and stop talking about it for a while.”

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4.5 Summary, synthesis, conclusion

This report has framed and analysed the Eindhoven living lab as a (transformative) social innovation. It has elaborated on the emergence, social context and agency aspects of it. The Eindhoven Living Lab is used as a label for a collection of various collaborative initiatives focusing on social challenges and the use of technology and data in the city. It is also seen as an approach to facilitate city wide learning and collaboration and does not refer to one dedicated physical place. The Eindhoven Living Lab is to a large extent funded by the municipality and politically acknowledged in the most important formal policy document of the city (the coalition agreement, Eindhoven, 2104) that describes the city in this context as ambitious, as a smart city, focusing on pioneering, innovation, sustainability, cooperation and dealing with societal challenges.

Eindhoven is a city that is often associated with innovation, design and digital technology. This can be explained by its recent history. Philips was founded in 1891 in the city of Eindhoven and that marked the beginning of a close relationship between city, industry and technology. In the 1930's another important Dutch technology based industrialist DAF (trucks) was founded in Eindhoven. This technology focus created ground for the establishment of the Eindhoven University of Technology in 1956. When Philips decided to move its headquarters to Amsterdam in 1997 Eindhoven had to become more creative and active in its commitment to become a knowledge and innovation hub around technology and design. The birth of the Brainport association in 2005 is part of this process. Brainport is an economic development agency that bring partners together, mainly from the public, private and research and education sectors and that promotes innovation. The first living lab initiative originates in 2010 and in 'Doornakkers' a neighbourhood in Eindhoven. It was a joint initiative of the municipality of Eindhoven, the provincial government 'Noord Brabant' and Brainport Health Innovation. The neighbourhood Doornakkers experimented with ICT applications in order to improve the health situation of senior residents. At the 5th of September 2014, Eindhoven was formally accepted as a member of the European Network of Living Labs.

The Eindhoven living lab is strongly connected to narratives and discourse around doing things together as is expressed by many words that are used in documentation and conversation concerning the living lab starting with 'co': co-creation, co-design, co-development, co-llaborate, co-operate etc. But is also about experimentation and words like laboratory, testing and prototyping (in the context of design) are commonly used. Living labs are also part of a trend and discourse focusing on ICT and the use of data and often associated with smart cities, internet of things and open source developments.

The living lab initiatives in Eindhoven are a direct response to the new challenges and new opportunities that are being experienced in the context. The type of challenges it relates to include: health, aging society, security and safety, sustainability, climate change, migration, etc. Eindhoven is considered to be a city that is unique in its collaboration and cooperation between actors, in which trust is key. It is seen as a tradition in a region with scarce resources – poor agricultural land and lack of raw materials where people nonetheless had to generate an income: the only way to survive and grow was to do it together. Since today's challenges are considered complex and interconnected, cooperation becomes even more important. The cooperation does not always need to be formally structured (sometimes it is important!) and the living labs should provide mainly space for experiments. It is acknowledged that many citizens expect a reliable

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government and it is a big and important challenge to make this happen in this context of experiments.

The living labs are also a response to possibilities that arise from technology. The major potential that is seen is the combination of high-tech developments and the use and availability of data (big data, open data, smart applications).

The political support for living labs is very important in Eindhoven: the local government policy addressed the importance of living labs and the 'living lab approach' and acknowledges that experimentation can only work if there is room for failure. Furthermore it aims to put citizens more at the centre than the city did traditionally.

If one reflects on the question if the living lab in Eindhoven is a true example of a transformative social innovation this question can be answered in two steps. The living lab is an approach that fits the definition of change in social relationships and new ways of doing, organizing, knowing and framing:

- Doing: doing things in an experimental manner, where things can go wrong,
- Organizing: it aims to link citizens, the public and the private sector and research and education institutions as a new and experimental governance model
- Knowing: its main aim is to do and organise differently in order to generate new knowledge
- Framing: the living labs is also a label that in itself is part of process of new framing.

It seems however that the existence of the concept or the organisational form of the living lab as it is described by ENoLL was not a necessary condition for the emergence of the Eindhoven living lab. In other words, the type of initiatives that are labelled as living lab would most probably also have emerged if the living lab concept would have been less popular or even absent. So the living lab label provides a useful framing that give the initiatives in Eindhoven a certain recognisability, and link it more easily to like-minded initiatives in other cities and countries, but it does not seem crucial. Then, the next step in assessing the living lab as transformative social innovation is to reflect on the extent to which the living lab focuses on change that challenges, alters and/or replaces (dominant) institutions and structures in its specific social context. The Eindhoven living lab has a rather harmonious relationship with existing and established institutions and structures. It does aim for doing this in another manner, but it does not do so by trying to clearly challenging, altering or replacing the established institutions and structures. It rather creates an alternative or complementary way of doing things that can co-exist with the establishment and that might, in the long-run have the indirect impact that the establishment will be change.

5 Local Initiative #2: Manchester Living Lab

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5.1 Introduction

Living Labs situate potential users of digital technologies in a co-creation role in the development and application of those technologies in real world settings. Contrary to popular notions of a laboratory, Living Labs need not be dedicated physical spaces. Indeed, a core methodology for implementing the Living Lab concept is to introduce digital technology into the spaces that users already inhabit, such as their homes or neighbourhoods. In these settings users ideally have the ability to manipulate the technology, and discuss its further development with designers and technologists, or even for users to appropriate the technology and put it to their own devices.

There are currently three organisations in Manchester associated with the Living Labs concept: MadLab, Future Everything, and the Shed. The latter two are members of the European Network of Living Labs (ENoLL). A fourth organisation, Manchester Digital Development Agency (MDDA), pioneered Living Labs in the city, and was a founding member of ENoLL; but MDDA closed in 2015 following funding cuts and re-organisations at Manchester City Council, which funded MDDA. The public implementation of digital technology was brought back within the council.

In practice, these Manchester organisations were already involved in user-centred, co-created experimentation and development with digital technology. As such, there was immediate recognition and interest when the Living Labs concept emerged. Living Labs articulated what groups in Manchester were already doing. ENoLL specifically, and the term more generally, has been a convenient association to have, and brought added significance, legitimacy and leverage to activities in the city.

5.2 Emergence of Living Labs in Manchester

The concept of Living Labs draws on a long tradition of user-centred and participatory research. It is not the first to argue for an active role for users in the design and development process of computer technologies (e.g. the Scandinavian Collective Resource Approach from the early 1980s, Ehn 1988). The term Living Lab is associated with work both at MIT and Helsinki city council and VTT Technical Research Centre – see network study. ENoLL was created in November 2006 under the auspices of the Finnish European Presidency, and after which it became a recognised term and concept in European work to promote digital technologies.

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Through their involvement in various European Commission projects, development workers at Manchester City Council had collaborations with Helsinki and VTT going back to the mid-1990s. These included the Telecities network set up in 1993, and which became the Eurocities Knowledge Society Forum, and more recently the EU Smart Cities portfolio. European collaboration on the introduction of digital technologies continued and deepened when the Council created MDDA in 2002. MDDA became a founder member of ENoLL.

Dave Carter is a key figure in the Living Labs story in Manchester: an active proponent of user-centred projects for developing digital technologies and their applications in Manchester. Dave became Head of MDDA, having led much of the Council's earlier work on digital technologies. His European connections were extensive, through various Commission projects and initiatives, and leading up to work on Smart Cities. He retired in 2015 – though remains active through his Chairing role for MadLab. Dave is a gregarious figure and born networker. In 2012 he was Chair of the EU Smart Cities Portfolio working group. It was through the activities of Dave and colleagues at MDDA that an emerging digital technology milieu in Manchester was able to connect with initiatives elsewhere in Europe, and at European level.

Most significantly, MDDA was able to develop a venue for digital technology activities in Manchester. Offices on Portland Street provided a space that others could use, or drop by, as well as a node for seeking help in getting ideas and projects going in the city. European connections and, specifically, funded projects provided resources to support a range of initiatives and organisations in the city.

Nowadays, the city is home to a vibrant digital sector. Trade association Manchester Digital has over five hundred member organisations, including freelancers, start-ups, and more conventional providers of digital technology; and which amounts to around 1800 individuals. Manchester Digital helps organise regular events and discussion fora where people can discuss possibilities for the digital economy in the city. It is claimed that there are over 50 meet-ups each month. These can include people wishing to share experiences in particular technologies or issues: one current example being interest in wearable technologies and the quantified self. In this sense, any coordinated trial of digital technology can happen informally.

It is important, however, to see current activity in the context of the historical significance of digital technologies for Manchester council and its aspirations for developing the city. European projects, including Living Labs, were a resource for advancing what key figures wanted to do with digital technology in the city. Like many industrial cities in the UK, Manchester suffered considerably from long-term manufacturing decline, particularly in its core sectors of textiles and engineering. Understanding the emergence of Living Labs in Manchester requires an appreciation of the post-industrial developments.

A characteristic of the city is that its administration has consistently been in the hands of the Labour Party and that, with shifts in ideology and leadership aside, has meant a relatively stable political context. Toward the end of the 1980s, city leaders began to see post-industrial cultural activity in Manchester as an economic asset to be promoted in the regeneration of the city. Alongside this was recognition that emerging digital technologies - linked to the creative industries - could play an important part in the regeneration of the city. There was support and encouragement from civic-minded individuals in local universities, and amongst some prominent

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public figures (e.g. Anthony Wilson). It was under these circumstances that support for what became digital technologies was forthcoming. Promoting the new digital technologies was framed around ensuring skills, creating jobs, and promoting social inclusion.

The challenge, then, was to translate this top-down initiative into opportunities accessible to entrepreneurs and communities in the city, and whose own interests were latent. So began a variety of initiatives to increase exposure to the new technologies, and to build up the technical infrastructure. People involved in this activity were engaged in Popular Telematics activities, and looking to provide accessible and affordable communication networks for communities. Other examples included, computer classes held in community centres around the city, and broadband networks were established, and later wifi and mobile technology. Fifty to sixty projects were funded through a mix of national urban regeneration programmes and local resources.

By the late 1990s, digital enterprises were emerging. These typically saw local creatives, with backgrounds in publishing or music, exploring the possibilities offered by the Internet and other digital technologies; projects were run to help with online marketing and distribution, using audiovisual technologies, and to provide users with access to suitable (and fast) communications infrastructures. Amidst this activity, Drew Hemment organised the first Futuresonic festival in Manchester in September 1996, and which explored the creative potential of the Internet and digital media. By 2010, the Futuresonic event and activities had developed into FutureEverything, and which continues to use art to explore innovations in using digital technologies and the exciting and troubling possibilities this raises for cities and citizens. FutureEverything became accredited to ENOLL in 2014 (see below).

Manchester city council became involved in European projects from the mid-1990s onwards, and which over time opened up connections and ideas with other cities introducing digital technologies, such as Helsinki, Amsterdam, Barcelona and Lisbon. The creation of the Manchester Digital Development Agency (MDDA) by the city council in 2002 provided a hub for connecting the emerging digital technology milieu in Manchester with the opportunities opening up through European funding and networks. MDDA bid into, and won, large European projects through its prominent role in these networks. By turns, MDDA was able to promote information cities, knowledge cities, digital cities and smart cities. They were also able to support initiatives suggested by groups in the city. So built up a kaleidoscope of activity locally, and connections internationally.

Dave Carter from MDDA said he first heard the term Living Lab in 2002. Helsinki city council was working with Nokia research on the collection and display of aggregated texting, which was a kind of early bulletin board that people could text to. As part of the development of the technology, Nokia had given away thousands of handsets to people in East Helsinki, and recruited 'e-janitors' capable of showing neighbours how to use the device. In interview, Dave said he thought this was action research with technology, but recognised that Living Lab was a more exciting term. He soon signed MDDA up to the network, and began promoting Living Labs ideas back in the city.

MDDA became a Living Lab and its projects and supports for initiatives in the city, as described above, became Living Lab activities. The focus was seen as exploring how increasing interconnectivity and data accessibility, through new internet technologies, could support economic and social life in the city. As Dave Carter wrote,

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“Both the idea and the practice of Living Labs, especially in the Manchester context, is then a very significant one, providing a mutually beneficial way of organising key parts of the innovation process and involving people locally, whether residents, students or businesses, in the co-creation and co-production of new applications and services. In Manchester, this meant that the MDDA effectively became the coordinating Living Lab for the city, both running some user-driven open innovation projects itself and also facilitating and supporting similar projects coming from grassroots initiatives with local research bodies, SMEs, artists and creative networks, and other community-based organisations.” (Carter 2013: 180)

Social innovation using digital technologies was seen as a component of this activity, “Social innovation in the community—involving local government, schools and colleges, public libraries, the voluntary sector, consumer groups and trade unions—is a necessary counterpart to organisational innovation led by industry, commerce and government.” (Carter 2013: 179)

Manchester became a key player in creating the ENoLL network. With encouragement from MDDA, Manchester Metropolitan University hosted the fourth Living Labs summer school in August 2014. In retrospect, this can be seen as the high-water mark for Manchester involvement in ENoLL and Living Labs internationally.

5.3 Living Lab dynamics

The role played by MDDA has already been discussed. In this section we consider the other Living Labs in the city. Future Everything has already been mentioned. It was amongst the third wave of Living Labs enrolled with ENoLL in 2009.

Future Everything is unusual in being an event-based Living Lab. The organisation built around the organisation of an annual weeklong festival of digital cultural activities across the city (see <http://futureeverything.org>). It is, perhaps, also unusual in the Manchester context in including critical viewpoints on digital culture. For example, the Chattr project it organised as part of its 2013 festival explored privacy issues in social media, by recording, gathering and then posting conversations gathered in rooms at the festival. This was just before the Snowden affair broke. The 2014 conference event, on Tools for Unknown Futures, and which I attended, was a mix of excitement and concern for digital technologies; and whether applications such as Big Data for smart citizens in heavily mediated cities really were tools for liberation or instruments of control. Compared to the more general ethos of finding ways for getting digital technologies out in the world, this seemed unusual for a Living Lab involved in criticism and cautionary reflection.

As such, Future Everything is not a technology festival of pitching and presenting new devices. Rather, it seeks to curate a festival as a social innovation mechanism, and hence a form of Living Lab that provokes cultural considerations. But alongside artistic provocations and evocations, are trials with technology and experimentation with devices. FE2014, for example, saw the launch of the Smart Citizen, user-led environmental monitoring platform in the UK (and developed originally by FabLab Barcelona). Increasingly, Future Everything is involved in year-round projects, such as

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working in Singapore, and big civic data projects for residents in Manchester. But at heart, they continue to develop the idea and practice of cultural festival as innovation experiment and laboratory.

The association with ENoLL is considered to have been helpful for Future Everything. Whilst it has not had a big effect on what they have done in Manchester, the engagement of Future Everything in ENoLL meetings, presentations, and discussions has prompted the organisation to reflect upon what it does and how it communicates itself formally. The practices it has developed over the years have become a methodology, and one that others have adapted (such as MUTEK, Today'sArt, and Unsound digital culture festivals). Having creatively appropriated the Living Lab concept, Future Everything has been able to take further steps into the promotion of innovation cultures and digital criticism.

The Shed, the third ENoLL affiliated Lab in Manchester, opened in 2104 at Manchester Metropolitan University. The Shed is a resource for the University's Digital Innovation activities. Over £1 million was invested into creating an incubation hub for start-up businesses and linked to the training of students and research at the University. Digital Innovation aims to work at developing relationships across the Universities diverse teaching disciplines, and cultivate new ways of teaching, researching and working with digital technologies; including helping graduates develop future work and businesses. The development of wearable technologies with fashion is an example of crossing disciplines and practices that The Shed aims to cultivate, and as part of rethinking the roles of educators. The Shed provides flexible workspace and digital technology resources, including a bureau for 3D printing. It hosts events as well as start-up enterprises, student projects and teaching classes. The Shed is open to the wider community, with groups such as Cybersalon, Raspberry Pi Jam, and others meeting and using the space.

The Shed became affiliated to ENoLL in 2014. As Director of Digital Innovation, Paul Bason, put it, "One of the priorities for MMU in the next few years will be to strengthen our international partnerships and joining this network will help the university with this strategy. The Living Lab approach puts users at the centre of technology projects and we know that this is important for academic research and for commercial companies. Therefore we hope that this will help to stimulate a whole range of new opportunities for students and staff who are involved with new technologies."⁵

Living Labs is seen as what The Shed does. Affiliation has been helpful, but not especially influential on the kind of convening, exploration and follow-up opportunities created by The Shed. ENoLL is not seen as a blueprint or model, but rather a stamp of approval. However, the focus at The Shed is on local development. Here the idea is to provide facilities where one can work with serendipity, where it is cheap to fail (workspaces for start-ups are free for first three months), and where teaching can keep up with the pace of change. But above all, The Shed is a space where people can meet and build relations around technology development, and find ways of working together, and respond to the opportunities arising from serendipitous connections that the space permits.

⁵ Press release, <http://diginmmu.com/education/2014-a-year-of-digital-innovation-901>

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MadLab (Manchester Digital Laboratory) is a grassroots, non-profit digital innovation organisation committed to science, technology, arts and culture. MadLab occupies a refurbished, former weavers' cottage in the Northern Quarter of the city, and where it hosts events and meet-ups, as well as housing co-working spaces and a hackerspace.

MadLab was formed in 2005, when founders were able to obtain a semi-derelict cottage for a peppercorn rent. The makerspace was made serviceable for meetings, partly with a grant from Manchester City Council, and MadLab began hosting various digital technology and related activities of various groups in Manchester. The space was refurbished extensively with a further grant from the Council, and re-opened in September 2015. MadLab's orientation is as a community-organisation. Activities are developed or welcomed that have a community benefit in mind, and that reach out beyond the digital technologies community. There is emphasis in trying to diversify the demographic of people involved in digital technology. MadLab estimates thirty per cent of its users are female, which is more than is typical in makerspaces.⁶ Alongside programming and digital technology activities, the space is also used for activities like jewellery and film-making – whatever has regular demand can be supported. The space is free to use, and supported by sponsors, donors and funding for specific project activities. So, for example, MadLab organises programming courses for girls under an agreement with the Workers' Educational Association.

A wide variety of user groups and activities go on in MadLab, as well as MadLab participating in collaborations with groups elsewhere. Over 25,000 users of MadLab are reported each year, according to a survey by Nesta.⁷ There are around 50 community groups run by over 100 volunteers. Activities include educational, outreach and research. User groups meeting at MadLab and using the facilities include the Manchester Space Agency, Wordpress web development groups (led by a founder of Wordpress, and MadLab board member), girl geek programming initiatives, bio-hacking activities. Recently, Asa Calow from MadLab was part of a British Council visit to Shenzhen in China to learn about makerspaces and digital manufacturing there. An Arts Council-Innovate UK grant means MadLab can host some digital artists in residence, and which will help cultivate activities.

Through these varied activities and commitment to grassroots involvement, MadLab has emerged as a respected makerspace in the UK, and an innovative convener of user involvement in digital technologies. MadLab does not describe itself as a LivingLab, although interviewees listed it amongst the Living Labs in Manchester. Certainly, the activities it undertakes are consistent with the Living Lab ethos. But, as with the other Labs in this report, the focus is on becoming a space for experimentation and engagement with digital technology, rather than a Living Lab per se; and in the case of MadLab this involves an emphasis in grassroots and community developments.

So, there a variety of organisations providing dynamic spaces for 'users' to engage in developments in digital technologies in the city, and that contribute to a lively digital technology milieu that spans the grassroots, education, public policy, and business, from start-ups to major suppliers. However,

⁶ <http://madlab.org.uk/equal-opportunities/>

⁷ http://www.nesta.org.uk/sites/default/files/open_dataset_of_uk_makerspaces_users_guide.pdf

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with the demise of the MDDA in 2015, which very much identified with Living Labs networks, so Manchester participation in Living Labs internationally has become less of a priority.

The city council has taken responsibility for digital economic development back in house, and is working on related-activities in smart cities, open data, and Internet of things. In this respect, it remains a lead city in several European projects. But these are not Living Lab activities per se. The projects and work are not using Living Labs explicitly. Future Everything is working internationally, and MadLab too with its links to China. But it is hard to see these activities as specific to Living Lab. Rather part of the broader mission of each to engage people in digital culture and technology.

5.4 The social agency of Living Labs

Given the history and situation described above, it is difficult to isolate the social agency of Living Labs in Manchester from other activities to include people in digital technology developments, and that preceded Living Labs, and that now looks set to operate beyond Living Labs. As a concept for engaging people in digital technology developments, Living Labs chimed with what people in Manchester were already doing and seeking. In Manchester, we see the development of a milieu for promoting digital technologies in the city, and with a social focus amongst some of it.

However, the enthusiastic experience in Manchester does prompt a reflection on the kinds of social agency Living Labs has contributed towards. As a methodology Living Labs risks, arguably, being somewhat retrograde in terms of social agency compared to earlier participatory design initiatives, such as the hopes for the collective resource approach in Scandinavia in the 1980s. Living Labs appeared originally to be about getting usable digital technologies out into communities. Methodologies for increasing the scope for resisting or radically reshaping digital technologies, for example, appeared absent. In Manchester, it is at events such as Future Everything's festival – particularly its more provocative installations, discussions and performances, that critical participation in digital technology arises, e.g. unsettling around privacy and other artistic activities. But none of this is hard wired into policy and decision-making. Rather, it works on the cultural level. There has been policy commitment in Manchester to ensuring digital technology roll-out attends to social inclusion, and so there has been scope for ensuring local communities can shape some forms of digital technology. Perhaps this is most evident in city authority support for MadLab, and its grassroots approach to digital technology experimentation.

The main thrust to the social agency of Living Labs is to make digital technologies work for users. Perhaps a subtle difference is being overstated here; but the difference contains within it the possibility that (potential) 'users' can reject or radically reshape digital technologies. No matter how much agency people develop over the shaping of the specific applications of the technology, the ultimate ability to explore problematic applications, and reject some forms of digital technology is important. The Shed is looking to the entrepreneurial development of digital technologies. MadLab, in being open to more grassroots involvement, develops capabilities in engaging in digital fabrication in a broader way, not limited to entrepreneurial approaches, though it includes these. As such, it contributes to the social agency for debating digital technologies, and

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in so doing, 'to help people to make things better, together' (MadLab website, accessed 10th November 2015). The capabilities aspired to in MadLab is a form of digital technological citizenship.

5.5 Conclusions

Manchester is home to a variety of spaces in which people can engage in digital technology for business, personal, and cultural reasons. Living Labs as a 'social innovation' has provided a platform for reflecting on the introduction of digital technology in Manchester, but not without any great impact per se. Socially innovative activities were already underway in Manchester. However, we see that Living Labs association has helped initiatives in Manchester leverage support, whether through European funds, or enhancing the status of those initiatives in the eyes of decision-makers locally. Associating with ENoLL has also enabled connections with other initiatives elsewhere and lessons to be shared. And participating in Living Lab events, such as running the summer school or presenting at events, has prompted some reflection on the part of initiatives in Manchester, has helpfully re-articulated purposes and activities.

Overall though, I cannot help but conclude that Living Labs has not been especially social innovative for Manchester. Rather, Living Labs has helped consolidate what groups in the city were already doing, and given them a platform to expand and do more.

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6 Synthesis

Living Labs have become an important approach for stimulating innovation in the 21st century. They offer a platform for linking research and practice (across public, private and community sectors) and by doing so, they intend to develop innovative approaches for dealing with a variety of (often socially pressing) issues. Besides that living labs are themselves subject of (academic) study. The academic field of study about living labs is however, still rather insignificant in terms of impact and quality (Schoorman et al, 2015). Conceptually it is mostly rooted in more established theories on innovation including Open Innovation and User Innovation (ibid) and it is considered part of the broader smart city approach (Schaffers et al, 2011).

The European Network of Living Labs (ENoLL) is a formalised network and international federation of benchmarked living labs in Europe and worldwide. ENoLL identifies 5 key elements that should be present in a living lab: 1) active user involvement; 2) real-life setting; 3) multi-stakeholder participation; 4) a multi-method approach and 5) co-creation. Even though it is not a formal requirement, in practice there is usually a strong focus on the use of digital technology and data. ENoLL aims to support co-creative, human-centric and user-driven research, development and innovation in order to better cater for people's needs. The core of ENoLL is formed by its members and partners which vary between a) effective members b) associated c) adherent members and d) strategic partners.

This section summarizes the findings of a study on the emergence, social context and agency aspects of the ENoLL and of living labs in two cities, both members of ENoLL: the Eindhoven Living Lab (the Netherlands) and the Manchester Living Labs (the United Kingdom). The Eindhoven Living Lab is used as a label for a collection of various collaborative initiatives focusing on social challenges and the use of technology and data in the city. It is also seen as an approach to facilitate city wide learning and collaboration and does not refer to one dedicated physical place. The Eindhoven Living Lab is to a large extent funded by the municipality and politically acknowledged in the most important formal policy document of the city (the coalition agreement, Eindhoven, 2014) that describes the city in this context also as ambitious, a smart city, focusing on pioneering, innovation, sustainability, cooperation and dealing with societal challenges. There are currently three organisations in Manchester associated with the Living Labs concept: MadLab, Future Everything, and the Shed. The latter two are members of the European Network of Living Labs (ENoLL). A fourth organisation, Manchester Digital Development Agency (MDDA), pioneered Living Labs in the city, and was a founding member of ENoLL; but MDDA closed in 2015 following funding cuts and re-organisations at Manchester City Council, which funded MDDA.

6.1 Emergence of Social innovation (SI).

The concept of Living Labs draws on a long tradition of user-centred and participatory research. It is not the first to argue for an active role for users in the design and development process of computer technologies. Important predecessors were. Its predecessors are identified by García *et al.* (2015) within certain periods as follows:

- ✓ 1960's-1970's: the Scandinavian cooperative and participatory design movement (e.g. the Scandinavian Collective Resource Approach from the early, cf. Ehn and Kyng 1987)
- ✓ 1980's: European Social Experiments with IT

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- ✓ 1990's: Digital City Projects
- ✓ 2000's: The living labs originate from MIT

The concept living lab originated from the work of Prof William Mitchell from MIT (US) (Erikson *et al.* 2005, LivingLabMIT.edu 2016). The concept also started to get used and further developed in Europe. Living labs were supported by the European Commission as an attempt to bridging the gap between R&D and market entrance (faster take up of R&D results) and to enable SMEs obstacles on local and regional markets in the fragmented European market place. It is linked with EC policies and initiatives such as EU2020, Digital Agenda, especially through initiatives such as EIPs on Smart Cities, Active and Healthy Ageing (AHA) and Future Internet. Several Living Lab Initiatives were supported by the EC (FP7, CIP ICT PSP programme, Interreg, etc.) as well as by various national programmes of European countries. Living Labs might further flourish in the context of Horizon2020, but there are also hints that the actual popularity of living labs is again decreasing since 2010 (Schuurman, 2015). European living labs started networking and an important moment for the living labs movement in Europe was the creation of the European Network of Living Labs (ENoLL) in 2006 under the Finnish EU Presidency. The main developments are summarized in the timeline below.

Scandinavian Participatory Design		European Social Experiments with IT	Digital Cities Projects	EC Funding for LLs		
				MIT: Living Lab	2006: ENoLL 2010: ENoLL formal	
1960	1970	1980	1990	2000	2010	2020

Figure 7: Timeline, from living lab to ENoLL

Source: construct of Author, based on Garcia et al. (2015) and Kivilehto (2013)

ENoLL is currently a non-profit international association representing a diverse community of over 395 “certified” Living Labs in March 2016, of which about 170 are active living labs. In this study we took a closer look at the Eindhoven Living Lab (the Netherlands) and the Manchester Living Lab (United Kingdom).

Eindhoven is a city that is often associated with innovation, design and digital technology. This can be explained by its recent history. Philips was founded in 1891 in the city of Eindhoven and that marked the beginning of a close relationship between city, industry and technology. In the 1930's another important Dutch technology based industrialist DAF (trucks) was founded in Eindhoven. This technology focus created ground for the establishment of the Eindhoven University of Technology in 1956. When Philips decided to move its headquarters to Amsterdam in 1997 Eindhoven had to become more creative and active in its commitment to become a knowledge and innovation hub around technology and design. The birth of the Brainport association in 2005 is part of this process. Brainport is an economic development agency that bring partners together, mainly from the public, private and research and education sectors and that promotes innovation. The first living lab initiative originates in 2010 and in ‘Doornakkers’ a neighbourhood in Eindhoven. It was a joint initiative of the municipality of Eindhoven, the provincial government ‘Noord Brabant’ and Brainport Health Innovation. The neighbourhood Doornakkers experimented with ICT applications in order to improve the health situation of senior residents. At the 5th of September 2014, Eindhoven was formally accepted as a member of the European Network of Living Labs.

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Through their involvement in various European Commission projects, development workers at Manchester City Council had collaborations with Helsinki and VTT (Technical Research Centre of Finland) going back to the mid-1990s. These included the Telecities network set up in 1993, and which became the Eurocities Knowledge Society Forum, and more recently the EU Smart Cities portfolio. European collaboration on the introduction of digital technologies continued and deepened when the Council created MDDA in 2002. MDDA (which closed down in 2015 as consequence of budget cuts) became a founding member of ENoLL.

It is important to see the emergence of the living lab activities in Manchester in the context of the historical significance of digital technologies for Manchester council and its aspirations for developing the city. European projects, including Living Labs, were a resource for advancing what key figures wanted to do with digital technology in the city. Like many industrial cities in the UK, Manchester suffered considerably from long-term manufacturing decline, particularly in its core sectors of textiles and engineering. Its administration has consistently been in the hands of the Labour Party and that, with shifts in ideology and leadership aside, has meant a relatively stable political context. Toward the end of the 1980s, city leaders began to see post-industrial cultural activity in Manchester as an economic asset to be promoted in the regeneration of the city. Alongside this was recognition that emerging digital technologies - linked to the creative industries - could play an important part in the regeneration of the city. It was under these circumstances that support for digital technologies was forthcoming and the support for those new digital technologies was framed around ensuring skills, creating jobs, and promoting social inclusion.

6.2 TSI dynamics

The development of living labs in general and of ENoLL specifically have been enabled by the focus on innovation (often with the idea that innovation mainly has a market value), ICT and collaborative experimentation in European policy and funding. If one looks at the evolution of ENoLL entrants it is clear that this number goes up from 2006 until 2010 and afterwards it declines. This can possibly be explained by the increased strictness of the admission procedure after 2010 (Schuurman 2015). Another probable explanation for this trends is that many living lab initiatives rely (mainly) on project based public funding streams that might have decreased after 2010.

Since the past decades there seems to be an increased awareness that no single institution or organisation can deal with societal challenges alone. Living labs are rooted in that notion as they are an example of new forms of collaboration between various existing institution and structures and that makes the living labs themselves actually a new institutions, or at least a new structure.

ENoLL and the two cases (Eindhoven and Manchester) that were studies, are strongly connected to narratives and discourse around doing things together as is expressed by many words that are used starting with 'co': co-creation, co-design, co-development, co-laborate, co-operate etc. But is also about experimentation and uses words like laboratory, testing and prototyping are commonly used. It further draws on notions of existing streams of innovation research and mainly on user innovation and open innovation, even though a systematic and theoretically informed links remains rare (Schuurman et al, 2015). Living labs are also part of trends and discourse focusing on

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ICT and the use of data and often associated with smart cities, internet of things and open source developments.

The living lab initiatives in Eindhoven are a direct response to the new challenges and new opportunities that are being experienced in the context. The type of challenges it relates to include: health, aging society, security and safety, sustainability, climate change, migration, etc. Eindhoven is considered to be a city that is unique in its collaboration and cooperation between actors, in which trust is key. It is seen as a tradition in a region with scarce resources – poor agricultural land and lack of raw materials where people nonetheless had to generate an income: the only way to survive and grow was to do it together. Since today's challenges are considered complex and interconnected, cooperation becomes even more important. The cooperation does not always need to be formally structured (sometimes it is important!) and the living labs should provide mainly space for experiments. It is acknowledged that many citizens expect a reliable government and it is a big and important challenge to make this happen in this context of experiments.

The living labs are also a response to possibilities that arise from technology. The major potential that is seen is the combination of high-tech developments and the use and availability of data (big data, open data, smart applications).

The political support for living labs is very important in Eindhoven: the local government policy addressed the importance of living labs and the 'living lab approach' and acknowledges that experimentation can only work if there is room for failure. Furthermore it aims to put citizens more at the centre than the city did traditionally.

In Manchester the focus on living labs is less explicit, while the focus on 'living lab type of values' has been and remains more dominant. There are a variety of organisations providing dynamic spaces for 'users' to engage in developments in digital technologies in the city, and that contribute to a lively digital technology milieu that spans the grassroots, education, public policy, and business, from start-ups to major suppliers. However, with the demise of the MDDA in 2015, which very much identified with Living Labs networks (ENoLL) Manchester's participation in Living Labs internationally has become less of a priority.

The city council of Manchester has taken responsibility for digital economic development back in house, and is working on related-activities in smart cities, open data, and Internet of things. In this respect, it remains a lead city in several European projects. But these are not Living Lab activities per se. The projects and work are not using Living Labs explicitly. Future Everything is working internationally, and MadLab too with its links to China. But it is hard to see these activities as specific to Living Lab. Rather part of the broader mission of each to engage people in digital culture and technology.

6.3 Agency in (T)SI

Agency is focused on the human dimension of change: how do people within organisations, initiatives, projects, networks etc. relate to the change that they are working for? Do they have influence and direction over their circumstances, are they working on change that is in-line with their personal motivations? What do they believe in? But also, who are (dis)empowered?

To enable ENoLL to implement its mission, *to support the evolution and the wide uptake of the living lab paradigm throughout Europe and worldwide*, it established a range of collaborative linkages with other organisations that have a complementary mandate, through Memorandums of

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Understanding. To date (March 2016), the ENoLL has formed strategic partnerships and alliances with organisations including the World Bank and EBN, the European BIC (Business & Innovation Centre) Network.

The agency and empowering capacity of ENoLL can be better understood by seeing Living Labs as small local ecosystem, focused around innovation. Those ecosystems should provide breeding ground for making new connections between various actors and besides that, the Living Labs dialogue with other local actor ecosystems (this means other ecosystems than living labs) and in that process new connections are also made. The new connections between various ecosystems create room where change can manifest itself. In addition, it creates the possibility for actors to move out of their comfort zones and to develop themselves.

Many living labs initiatives rely on (project based) subsidy and this can reduce their autonomy, until date it remains a challenge to make living lab initiatives more (financially) sustainable. But in contrast to that, the funding of ENoLL relies on membership fees and diverse project funding that is the result of the active acquisition of the ENoLL staff (there is no subsidy for carrying out general administrative tasks, while those tasks are done by paid employees). This funding structure ensures that the focus of ENoLL is strongly focused on supporting its members, who pay for the existence of the network.

In the Eindhoven living lab it is very clear that many connected professionals share some values and passions that are very critical for the living lab. The relative weight that those values and the passions have differ for the different professionals but they all connect to the living lab activities and include:

- Focus on dynamics, innovation and experimentation in open-ended processes that should lead gradually towards a new system;
- Putting citizens first and at the centre of each innovation, but in a process that goes hand in hand with technology, and data.

Despite the strong desire to focus on and engage citizens in the living lab, in practice it is hard to realise this. There even are examples where the focus technology actually overshadows the focus on people.

There is no generally agreed theory of change that forms the basis for the living lab, but as a city Eindhoven summarized its values along 3 lines: on a) being close to citizens, being concerned about local issue and being connected and committed to the city of Eindhoven, b) on being brave to do things differently if needed and c) on acting rather than talking.

Finally, the living lab aims to use data and technology in such a way that it empowers citizens, including vulnerable citizens. At this stage it is hard to see to what extent this is really happening, but in general there is an understanding that the living lab still needs to develop itself in order to achieve its goals in terms of citizen empowerment.

Given the history and situation briefly described in this summary report, it is difficult to isolate the social agency of Living Labs in Manchester from other activities to include people in digital technology developments, and that preceded Living Labs, and that now looks set to operate beyond Living Labs. As a concept for engaging people in digital technology developments, Living Labs chimed with what people in Manchester were already doing and seeking. In Manchester, we see the development of a milieu for promoting digital technologies in the city, and with a social focus amongst some of it.

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However, the enthusiastic experience in Manchester does prompt a reflection on the kinds of social agency Living Labs has contributed towards. As a methodology Living Labs risks, arguably, being somewhat retrograde in terms of social agency compared to earlier participatory design initiatives, such as the hopes for the collective resource approach in Scandinavia in the 1980s. Living Labs appeared originally to be about getting usable digital technologies out into communities. Methodologies for increasing the scope for resisting or radically reshaping digital technologies, for example, appeared absent. In Manchester, it is at events such as Future Everything's festival – particularly its more provocative installations, discussions and performances, that critical participation in digital technology arises, e.g. unsettling around privacy and other artistic activities. But none of this is hard wired into policy and decision-making. Rather, it works on the cultural level. There has been policy commitment in Manchester to ensuring digital technology roll-out attends to social inclusion, and so there has been scope for ensuring local communities can shape some forms of digital technology. Perhaps this is most evident in city authority support for MadLab, and its grassroots approach to digital technology experimentation.

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7 References

References and data used for Chapter 1, 3 and 6:

Anna Kivilehto (2013) PowerPoint delivered for ENoLL, InnoMatNet Tool Session, 'ENoLL Hannover-2013-Anna', Published on Apr 12, 2013, accessed in October 2015, via: <http://www.slideshare.net/openlivinglabs/enoll-hannover2013anna>

Baljko, Jennifer (2014) The Rise of Smart Cities (21 October 2014) published on <http://electronics360.globalspec.com/article/4666/the-rise-of-smart-cities>

Charles Wyplosz (2010), The failure of the Lisbon strategy, 12 January 2010, on VOX CEPR's Policy Portal Research-based policy analysis and commentary from leading economists, accessed in October 2015, via: <http://voxeu.org/article/failure-lisbon-strategy>

Commission of the European Communities (2005) Communication From The Commission To The Council, The European Parliament, The European Economic And Social Committee And The Committee Of The Regions, "i2010 – A European Information Society for growth and employment", Brussels, 1.6.2005, Com(2005) 229 Final, accessed in October 2015, via: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0229:FIN:EN:PDF>

Corporateinnovation.berkeley.edu (2016) <http://corporateinnovation.berkeley.edu/about/faculty-staff/>

Corvinno (2011) European Network of Living Labs (ENoLL) - Launch Event for the 5th wave of Living Labs was on 16 May 2011, Gerbeaud Event House, Budapest, Hungary, accessed in October 2015 via: <http://corvinno.hu/enoll>

EC (2014), European Commission Competitiveness and Innovation Framework Programme (CIP), accessed in October 2015, via: <http://ec.europa.eu/cip/> yearly work programmes via: http://ec.europa.eu/information_society/activities/ict_psp/library/wp_call/index_en.htm

EC (2016) Horizon 2020 , accessed via <http://ec.europa.eu/programmes/horizon2020/en/>

Ehn, P., Kyng, M. (1987) "The Collective Resource Approach to Systems Design," in G. Bjerknes et al (eds.) Computers and Democracy, Gower Pub Co (August 1987), pp (251-278)

Eindhoven, 2014, Coalitieakkoord 2014-2018, expeditie Eindhoven, iedereen mee. PdvA, d66, SP, Groen Links.

Eriksson, M., Niitamo, V-P., Kulkki, S., (2005) State-of-the-art in utilizing Living Labs approach to usercentric ICT innovation - a European approach. http://www.vinnova.se/upload/dokument/verksamhet/tita/stateoftheart_livinglabs_eriksson2005.pdf

Eskelinen, Jarmo, García Robles, Ana, Lindy, Ilari, Marsh, Jesse, Munte-Kunigami, Arturo, Editors, (2015) Citizen-Driven Innovation – A Guidebook for City Mayors and Public Administrators. ©World Bank and ENoLL

transformative social innovation theory

European Commission Research Directorate General (2007) The Seventh Framework Programme (FP7), accessed in October 2015, via: https://ec.europa.eu/research/fp7/pdf/fp7-brochure_en.pdf

Finland's EU Presidency (2006) The Helsinki Manifesto, 20.11.2006 - We have to move fast, before it is too late - accessed in October 2015, via: http://elivinglab.org/files/Helsinki_Manifesto_201106.pdf

García Robles, A., Hirvikoski, T., Schuurman, D. & Stokes, L., (eds.) (2015), Introducing ENoLL and its Living Lab community, © ENoLL

GUST 'Governance of Urban Sustainability Transitions' (2016), <http://www.urbanlivinglabs.net/>

Hargroves, K. and Smith, M. (2005) The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century, The Natural Edge Project, Earthscan, London. Partly available online via: <http://www.naturaledgeproject.net/NAONChapter1.4.aspx>

Kresing, Frank (2009), Living Labs Hoop of Hype? [Living Labs hope or hype?] published on: <https://www.frankwatching.com/archive/2009/03/31/living-labs-hoop-of-hype/>

Lisbon European Council (2000) Presidency conclusions of the Lisbon European Council, 23 and 24 march 2000, accessed in October 2015, via: http://www.consilium.europa.eu/en/uedocs/cms_data/docs/pressdata/en/ec/00100-r1.en0.htm

LivingLabMIT.edu (2016) <http://livinglab.mit.edu/>

Naturaledgeproject.net, 2015: <http://www.naturaledgeproject.net/NAONChapter1.4.aspx>

Openlivinglabs.net.au, 2016, Australian Living Labs Innovation Network (ALLIN). <https://openlivinglabs.net.au/events/>

Polymerinnovationblog.com, 2010 (image of open innovation model of Henry Chesbrough) polymerinnovationblog.com/wp-content/uploads/2010/11/open-innovation-cropped.jpg

Pro.Europeana.eu (2014) Introducing ENoLL, the European Network of Living Labs accessed in October 2015, via: <http://pro.europeana.eu/blogpost/introducing-enoll-the-european-network-of-living-labs>

Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson, M., Oliveira, A. (2011) Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation in Domingue, J. et al. (Eds.): Future Internet Assembly, LNCS 6656, pp. 431–446, 2011.

Schuurman, D. (2015) Bridging the gap between Open and User Innovation? Exploring the value of Living Labs as a means to structure user contribution and manage distributed innovation. Dissertation in order to obtain the title of Doctor in the Communication Sciences, University of Ghent.

Schuurman, D., De Marez, L., Ballon, P. (2015) Living Labs: a systematic literature review, Research Day Conference proceedings 2015, Open Living Lab Days in Istanbul, ISBN (e-book): 9789082102741

transformative social innovation theory

WorldBank.org, 2012: <http://www.worldbank.org/en/news/feature/2012/07/13/world-bank-enoll-strengthen-cooperation-on-open-innovation>

References used for Chapter 4

Reviewed websites and reports:

- ✓ Brainport.nl (2015a) <http://www.brainport.nl/en/about-brainport> , accessed November 2015
- ✓ Brainport.nl (2015b) <http://www.brainport.nl/en/history>, accessed November 2015
- ✓ Brainport.nl (2015c) Living Lab laat ander licht schijnen op Stratumseind, <http://www.brainport.nl/high-tech-systems-materials/living-lab-laat-ander-licht-schijnen-op-stratumseind> , accessed November 2015
- ✓ Brainport.nl (2015d) <http://www.brainport.nl/en/live/culture-leisure?se=stratum> and <http://www.brainport.nl/high-tech-systems-materials/living-lab-laat-ander-licht-schijnen-op-stratumseind> , accessed November 2015
- ✓ Brainport.nl (2016) <http://www.brainport.nl/ondernemen/eindhoven-finalist-european-capital-of-innovation-award> , accessed February 2016
- ✓ DAF Oldtimer truck club (2016) <http://www.daftruck.nl/geschiedenis.html> , accessed February 2016
- ✓ Dichtbij.nl (2010) <http://www.dichtbij.nl/eindhoven/regionaal-nieuws/artikel/2488551/eindhovenaren-testen-ict-in-living-lab.aspx?sml=true>, accessed December 2015
- ✓ Eindhoven (2015a) Slim Licht <http://www.eindhoven.nl/inwonersplein/leefomgeving/slim-licht/Samenwerking-in-living-labs.htm>, accessed December 2015
- ✓ Eindhoven (2015b) Powerpoint about living lab Stratumseind 2.0, prepared by Tinus Kanters, June 2015.
- ✓ Eindhoven (2015c) Commissie Notitie, gemeente Eindhoven, Raadsnummer 15R6549, Inboeknummer 15bst01492, Dossiernummer 15.45.251, Onderwerp: Brainport Development. Input Jaarplan 2016, [http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1397054/type=pdf/Commissienotitie Brainport Development. Input Jaarplan 2016.pdf](http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1397054/type=pdf/Commissienotitie_Brainport_Development.Input_Jaarplan_2016.pdf) , accessed December 2015
- ✓ Eindhoven (2015d) Raads informatiebrief, gemeente Eindhoven Raadsnummer 15R6388 Inboeknummer 15bst00908 Dossiernummer 15.28.305 Beslisdatum B&W 7 juli 2015 Onderwerp: ondertekenen Stroomversnelling Brabant 'Nul op de Meter'. [http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1328091/type=pdf/RIB Ondertekenen Stroomversnelling Brabant Nul op de Meter .pdf](http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1328091/type=pdf/RIB_Ondertekenen_Stroomversnelling_Brabant_Nul_op_de_Meter.pdf) , accessed December 2015
- ✓ Eindhoven (2015e) jaarverslag en jaarrekening 2014, [http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1196504/type=pdf/Bijlage 1 Jaarverslag en Jaarrekening 2014.pdf](http://eindhoven.notudoc.nl/cgi-bin/showdoc.cgi/action=view/id=1196504/type=pdf/Bijlage_1_Jaarverslag_en_Jaarrekening_2014.pdf) , accessed December 2015

transformative social innovation theory

- ✓ Eindhoven Press Releases (2014) <http://www.eindhoven.nl/actueel/persberichten/Jaarrekening-Eindhoven-2014-positief-saldo-van-13-miljoen-euro.htm> , accessed December 2015
- ✓ Eindhoven Press Releases (2015) <http://www.eindhoven.nl/actueel/persberichten/Investeren-om-sterk-te-blijven.htm> , accessed December 2015
- ✓ Eindhoven (2014) Coalitieakkoord 2014-2018, expeditie Eindhoven, iedereen mee. PdvA, d66, SP, Groen Links.
- ✓ Eindhoven (2016) Vacancy tekst for area coordinator: gebiedscoördinator
- ✓ ENoLL.eu (2014) <http://www.openlivinglabs.eu/livinglab/eindhoven-living-lab> , accessed December 2015
- ✓ Eurocities.eu (2015) <http://www.eurocities.eu/eurocities/forums/knowledge-society&tpl=home> , accessed January 2016
- ✓ Forbes.com (2014) <http://www.forbes.com/sites/sarwantsingh/2014/05/12/the-top-10-mega-trends-of-the-decade/2/#62b2cb925eae>, accessed January 2016
- ✓ G1000Eindhoven.nl (2016) <http://g1000eindhoven.nl/> , accessed January 2016
- ✓ Geonovum.nl (2016) <http://www.geonovum.nl/onderwerpen/sensor-data-en-smart-cities/algemeen-living-lab-internet-everything> , accessed January 2016
- ✓ Isgeschiedenis.nl (2015) http://www.isgeschiedenis.nl/nu/oprichtingsdag_tu_eindhoven/ , accessed December 2015
- ✓ Lambrechtse, Erik, (2011) Slimme Zorg, zelfstandig wonen met gemak, Video provincie Noord Brabant over slimme zorg in Doornakkers, Eindhoven, Community: living-lab-e-health-Eindhoven, created by Erik Lambrechts on 19-06-2011, https://www.onsplatform.tv/living-lab-e-health-eindhoven/slimme-zorg--zelfstandig-wonen-met-gemak_1 , accessed January 2016
- ✓ Mijn-thuis.nl (2015) <https://www.mijn-thuis.nl/100jaardomein/site.swf> , accessed January 2016
- ✓ NPO geschiedenis (2010) <http://www.npogeschiedenis.nl/nieuws/2010/april/Philips-NatLab-proeftuin-van-de-voortgang.html> , accessed December 2015
- ✓ NRC (1998) <http://retro.nrc.nl/W2/Lab/Profiel/Philips/verhuizing.html>, accessed December 2015
- ✓ Trendsactive.com (2016) <http://www.trendsactive.com/#!/our-trends/societal-trends/>, accessed February 2016
- ✓ Triangulum-Project (2015) <http://www.triangulum-project.eu/lighthouse-cities/eindhoven> , accessed January 2016
- ✓ TU/e (2015) <https://www.tue.nl/studeren/studeren-aan-de-tue/eindhoven-studentenstad/geschiedenis-van-eindhoven/> , accessed January 2016
- ✓ Vlassenrood, Linda (2015) Het Nieuwe Instituut, de Staat van Eindhoven Mapping, <http://destaatvaneindhoven.hetnieuweinstituut.nl/mapping>, accessed January 2016

transformative social innovation theory

- ✓ Waag.org (2015) <https://www.waag.org/nl/blog/code-eindhoven-van-start>, accessed January 2016
- ✓ Watwerktindewijk.nl (part of Platform31.nl), 2012, <http://www.watwerktindewijk.nl/index.cfm/interventie/details?id=214>, accessed January 2016

References for Map 2 and 4, Eindhoven Living Lab:

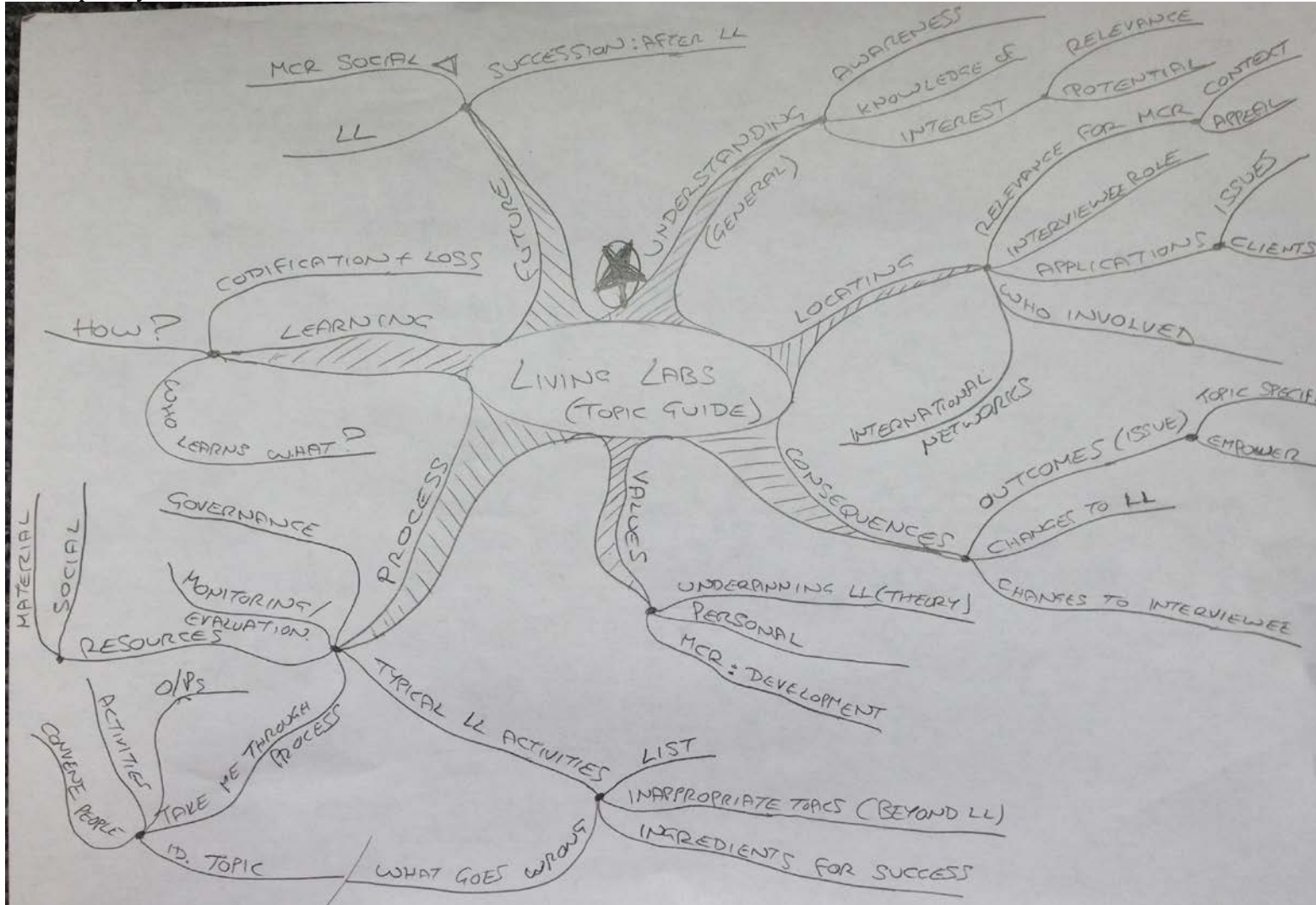
- ✓ Map: <http://www.stadindex.nl/plattegrond/eindhoven>
- ✓ ENoLL website –overview of various initiatives
- ✓ Eckhart/Vaarbroek City Studios- <https://www.woonbedrijf.com/pers/beeldenbank/ruimte-voor-initiatieven-en-eigen-keuzes-bewoners>
- ✓ Stratumseind 2.0
- ✓ Roadmap for Urban Lighting - <http://www.eindhoven.nl/inwonersplein/leefomgeving/slim-licht/Living-labs-in-tien-gebieden.htm>
- ✓ Striip S
- ✓ Slimmer Leven 2020 / Innovation Network for Active and Healthy Ageing - <http://www.slimmerleven2020.org/>

8 Annexes

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8.1 Topic Guide

Developed by Adrian Smith



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8.1 Geographical spread within ENoLL

Dr. Tuija Hirvikoski	Director Laurea University of Applied Sciences (Laurea Living Labs)	Finland -1	(PRESIDENT)
Mr. Artur Serra,	Deputy Director, i2cat Fundacion	Spain-1	(VICE PRESIDENT)
Prof. Dr, Pieter Ballon,	Director Living Labs, iMinds	Belgium-1	(SECRETARY)
Mr. Esa Ala-Uotila,	Customer Relationship Director, TAMK, Suuntaamo	Finland-2	(TREASURER)
Mr. Juan A. Bertolín,	Chief Innovation Officer (CIO) at espaitec, Science and Technology Park (eLiving Lab)	Spain-2	
Mr. Marco Combetto,	Innovation manager at Informatica Trentina spa ("Trentino as Lab" living lab)	Italy-1	
Mr. Jarmo Eskelinen,	CEO of Forum Virium Helsinki	Finland-3	
Mr. Paul Fairburn,	Director of Enterprise & Innovation at Coventry University (City Lab Coventry)	United Kingdom-1	
Mr. Jokin Garatea,	Manager of the International Project Department, Gaia (BIRD Living Lab)	Spain-3	
Mr. Joan Batlle Montserrat,	Assistant Director at department of Creativity and Innovation - Barcelona Institute	Spain-4	

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	of Culture (Barcelona Lab)		
Ms. Sakariina Heikkanen,	R&D&I Specialist at HAAGA-HELIA University of Applied Sciences	Finland-4	
Dr. Marita Holst,	Botnia General Manager, Luleå University of Technology (Botnia Living Lab)	Sweden-1	
Prof. Joelle Mastelic,	Professor & Researcher at the University of Applied Science Western Switzerland (Energy Living Lab)	Switzerland-1	
Mr. Adam Olszewski,	Implementation manager at Poznan Supercomputing and Networking Center (Poznan Living Lab)	Poland-1	
Mr. Ismael Perea,	Executive Director, Consortio Fernandez de los Rios	Spain-5	
Dr. Brigitte Trousse,	President of French Living Labs	France-1	

Council members in 2015, based on ENoLL website 2015

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Name	ENoLL Member	Status
Tuija Hirvikoski	Laurea UAS	President of ENoLL, Re-election until August 2019
Pieter Ballon	iMinds	ENoLL Secretary, Re-election until August 2019
Leena Makela	Tampere University of Applied Sciences	Re-election until August 2019
Artur Serra	i2 CAT foundation	Vice-President of ENoLL Re-election until August 2019
Juan Bertolin	Espaitec / eLivingLab	Continuing terms of service until August 2018
Jokin Garatea	Sociedad de Ciencias Aranzadi Gaia	Continuing terms of service until August 2018
Ismael Perea	Consortio Fernandez de los Rios Foundation	Re-election until August 2019
Marita Holst	Lulea University of Technology	Re-election until August 2019
Paul Fairburn	Coventry University	Continuing terms of service until August 2018
Adam Olszewski	PSNC Poznan	ENoLL Treasurer, Re-election until August 2019
Joan Battle	ICUB Barcelona	Continuing terms of service until February 2018
Brigitte Trousse	INRIA / France LLS	Continuing terms of service until August 2018
Joelle Mastelic	Energy LLS	Continuing terms of service until August 2018
Wim de Kinderem	Brainport Eindhoven EU office	Continuing terms of service until February 2019
Yilmaz Cakir	Basaksehir LL	Continuing terms of service until February 2019

Council members in 2016, based on ENoLL website 2016

Count per country:

Finland	2
Begium	1
Spain	5
Sweden	1
UK	1
Poland	1
France	1
Switzerland	1
Netherlands	1
Turkey	1

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8.2 Trends

1. **Connectivity and Convergence:** By 2020, there will be over 5 billion internet users, with over half of them accessing the internet over handheld tablet devices and 80 billion connected devices worldwide. (..) A new range of technology enabled services such as smart lighting, mobile working solutions, and smart governance will define and shape our everyday experiences.
2. **“Bricks and Clicks”** will become the retailing norm of the future, with every retailer expected to have an online identity as well as a brick and mortar presence by 2020.
3. **Future of Mobility:** In the future, people and organizations will want personal mobility (not necessarily cars or trucks) to travel from A to B, as journeys will become integrated with intelligent and smart technologies, enabled by a single ticket or membership to provide seamless travel on multi-modal transport systems with the car becoming an integral part of a wider transport network.
4. **Urbanization – City as a Customer:** (..) we will see cities expanding to form mega cities, mega regions and even mega corridors, (..) These “mega districts” will be so large that businesses will increasingly regard them as key focus centers for investment and put “city as a customer” as a central piece of their strategy, as opposed to nations.
5. **Social Trends Changing:** Social trends in Generation-Y, rise of middle class, an aging population, reverse brain drain, Halal economy, a heterogeneous society, generational political change in nations like India, abolition of single child policy and hukou system in China, aging population and women’s empowerment will usher in some deep socioeconomic changes in our future society.
6. **Health, Wellness and Well-being:** (..) The definition of healthcare will change as economies struggle to afford healthcare costs, which will affect 20 percent of a nation’s GDP in a developed world. Focus will shift to mass prevention and diagnoses and to wellness aspects of the mind, body and soul.
7. **“Innovating to Zero”** is the mega vision of a “Zero Concept” world where we will shift focus and develop products and technologies that “Innovate to Zero” in real life, thereby bringing social innovation to the forefront. We will have cars with zero emissions, zero accidents and zero fatalities.
8. **Smart is the New Green:** “Green” was a mega trend of the last decade and while it will continue to be important, there will be a shift towards “smart” products, which are intelligent, connected and have the ability to sense, process, report, and take corrective action.
9. **Value for Many:** The emergence of a global middle class of 4 billion people and a connected community on the internet of 5 billion will allow entrepreneurs and businesses to “make one, sell many,” a concept that will be ever more important and usher in a new business model of “value for many.”
10. **Future of Energy:** The energy industry will converge with several related industries to develop efficient and environment friendly solutions. Key trends we will see in this area include the Smart Grid and the future ‘Energy Internet’. (Forbes.com, 2014).