Stakeholder Engagement in the Smart City: Making Living Labs Work

Krassimira Paskaleva, Ian Cooper, Per Linde, Bo Peterson and Christina Götz

1 Introduction

In the course of the past decade, debates about the future of cities have been increasingly influenced by discussion of so-called 'Smart' cities. In parallel, the 'smart city' concept, often with a fairly elusive definition, is being used in a variety of contexts, by cities and organisations or businesses, and by policymakers around the world. In countries within the European Union, the smart city paradigm is taking shape as a twenty-first century policy imperative, linking contemporary urban development factors in a common framework, as highlighting the importance of information and communication technologies (ICTs) and other high-tech solutions for enhancing innovation, growth, competitiveness and sustainability (Caragliu et al. 2011; Komninos 2009; Paskaleva 2009; EC 2010a). Inside this trend, the 'inclusive smart city' approach has gained special interest since it advocates

K. Paskaleva (✉)
Manchester Business School, University of Manchester, Manchester, UK
e-mail: krassimira.paskaleva@mbs.ac.uk

I. Cooper
Eclipse Research Consultants, Cambridge, UK
e-mail: icooper@dircon.co.uk

P. Linde · B. Peterson
Malmö University/Medea, Malmö, Sweden
e-mail: per.linde@mah.se

B. Peterson
e-mail: bo.peterson@mah.se

C. Götz
Karlsruhe Institute of Technology, Karlsruhe, Germany
e-mail: christina.goetz@kit.edu

the importance of social and relational capital in urban development by focusing, amongst other issues, both on social inclusion in the Digital Age and on involving citizens in service development to have more effective public services that better reflect the needs of the citizens (Ballon et al. 2007; Deakin 2007; Paskaleva 2011). More recent research on FI technologies and services in the European Union has also emphasised the need of applying a citizens-centred approach to the smart city, since this is believed to help form dense social ecosystems that are heavily reliant on Internet technology. In turn, these Internet technologies and applications can greatly influence social interactions (EC 2014a). In this approach, harnessing the potentials for open innovation through stakeholder engagement in living labs environments—where research and innovation processes are merged with local, real-life contexts—has emerged as a promising new instrument for building the smarter city (EC 2010b; Mulder et al. 2008; Mulvenna et al. 2010; Schaffers et al. 2012a). As a result of these trends, a large number of smart cities in Europe are using living labs to shape the applications and services being developed for their citizens, at both micro- and macrolevels. Some high-profile examples include Copenhagen, Amsterdam, Vienna, Barcelona, London, Hamburg, Oslo, Brussels and Frankfurt (Cohen 2012). Despite the wide interest in this approach, however, stakeholder engagement in the smart city living lab is yet to be fully understood by researchers and practitioners alike, as are the effective ways for implementing it along with the real benefits it may deliver.

In the new field of smart city Europe and the FI, there is a growing recognition that open innovation can be a gateway to grasping the nature of this phenomenon (Almirall and Wareham 2008; Carter 2011; Draetta and Labarthe 2010). In an earlier work, one of the authors of this study (Paskaleva 2011, p. 161) observed that '[ ]…open innovation is a new paradigm for the Smart City where government and developers draw on the expertise, skills and knowledge of the citizens to co-produce urban services that are directly relevant to its citizens and their environment'. In this way, she suggested '[ ]…open innovation becomes an integral part of a much broader shift across urban sectors and city networks that are most visible in forming co-productive relationships between the public, private, academic and voluntary stakeholders'. She further stated that 'In the course of this trend, new models of production and consumption of public services emerge, where boundaries between producers and consumers are becoming blurred and involve both formal and informal interactions between the providers and the users, to share the values, abilities and capacities they have'. However, to move forward on this innovative form of collaborative processes, a new logic, principles and agendas appear necessary for the smart city. Amongst these, those relevant to sustainable stakeholder engagement in innovation processes are amongst the most pressing. Clearly, to create a smart open innovation urban ecosystem, we need to first define what constitutes stakeholder engagement in the living lab as well as the conditions and the factors that lead to it operating effectively.

Recently Gould (2012) found that there is a positive relation between open innovation and stakeholder engagement (see also Ayuso et al. 2011). By integrating recent developments in stakeholder theory with a process-based view of

open innovation, Gould claimed that the focus should be on value creation in the building of the relationship. To further the discourse, he also pointed out that more detailed identification and analysis of the specific processes involved in both open innovation and stakeholder engagement are evidently necessary, particularly, as he stressed, '[ ]…in defining and mapping the specifics of stakeholder relationships and engagement processes in the context of open innovation' (p. 3). If a smart city living lab is viewed as an open innovation urban ecosystem, then identifying and involving each city's unique set of stakeholder groups and individual citizens in forming a smart city network for the co-production of new services seems a logical first step forward. However, how to do this remains largely unexplored till now. This chapter is an attempt to advance understanding on this issue. The study reported seeks to further debate about stakeholder engagement in the smart city living lab with regard to the development of FI services. The latter are treated in this chapter as software applications about the city, co-produced with their citizens, in their city and localities, with various ubiquitous computing interfaces such as web through laptops and tablet computers, mobile smartphones with locative and augmented reality content, or open sensor networks and NFC/RFID interfaces (based on Lemke and Luotonen 2009). Two important issues are at the centre of practice domain. First, 'How can citizens be effectively and efficiently involved in the co-production of innovative smart city services?' And second, 'How to engage with the urban stakeholders in ways that provide for not just a better access and inclusion for citizens but also that empower them to act as a catalyst in transforming the dynamics of smart city services?' (SmartiP 2010). It would seem that adopting a living lab approach holds out promise of the wanted answer for many smart cities in Europe. Yet, despite many practical efforts that have already been made, as Paskaleva discovered '[ ] …cities still need to reconfigure what they take to be the underlying role and assumptions that shape stakeholder engagement' (2011, p. 170).

Although much of the current work on the smart city emphasises the role of stakeholder engagement in the co-production of services, discussion about how this should be achieved remains vague and there are far too ambiguities as yet unresolved (Kujala 2003; Schaffers et al. 2012a). For example, most studies talk about 'user participation' and/or 'user involvement', while only a few use the concept of 'stakeholder engagement'. There are no major works that deal with the differences raised by this vocabulary, and what they mean in practice in detail. Important insights about the nature of the process in reality and the factors that influence its success remain lacking. Hence, it is unclear whether stakeholder engagement in the smart city living labs is actually working and whether, in practice, it is producing the desired outcomes as well as the impacts sought. As a result, we still know surprisingly little about this aspect of how the 'smart city' works. In this sense, the vocabulary of stakeholder engagement hides as much as it reveals. Are cities really getting effectively involved in the co-production and in the use of new and innovative smart services? At present, such questions have to remain open. Instead, it seems fair to say that, despite the growing rhetoric and the many EU-funded efforts, whether urban communities in Europe have really risen to the challenge of

delivering the expectations raised for the smart city continues to be an unanswered question.

By looking at leading edge literature across the fields of smart cities, open innovation, living labs, stakeholder theory and participatory design—as well as the experiences of five cities in Europe—this chapter attempts to shed light on the theme of stakeholder engagement in the smart city living lab. In the sections that follow, we present a framework for how stakeholders can productively work together to co-produce more satisfying services for them all. Treating stakeholder engagement as a gradual *process* by which a smart city involves its citizens in the co-production of local services that will enhance their lives and the attractiveness of the city to people, businesses and tourists, our focus is on the underlying conditions that makes this complex engagement 'work'. We touch upon two important dimensions operating here (i) the 'soft relational factors', relevant, as some authors call it, to 'stakeholder involvement', a construct associated with the importance and the personal relevance that users attach to either a particular system or the information society in general (Lin and Shao 2000) and (ii) the 'hands-on' participatory activities which emphasise democratic 'user participation' in system development through prototyping and workshops (e.g. Hwang and Thorn 1999). We stress that the term 'stakeholder engagement' is a wide, encompassing concept that refers to both to the process and to the activities involved in the co-production of innovative urban services along with the social connections and relations that citizens develop within a smart city ecosystem.

We employ a systematic methodology. First, based on a preliminary critique of some of the more rhetorical aspects of how smart cities need smart citizens, we present an overview of the concept of 'smart city stakeholder engagement' and its application in the living lab to the co-production of smart city services. We offer a critical review of previous discussion of such engagement, emphasising the need of breaking up the process into its constituent and sequential stages along with the skills and the expertise necessary to launch these and then maintain successful co-production activities. We then define these components (process stages and related activities) as two main ingredients that are essential to make a living lab'work'. Building on cross-fertilization of state of the art concepts and approaches, our analysis goes further to position stakeholder engagement in the context of the urban ecosystem—the amenities afforded by a specific place and culture—so called 'Arenas' where co-production takes place. We then provide a focussed and operational framework for the stakeholder engagement and construct and present evidence about its meaning in the co-production of smart sity services. The stakeholder engagement practices adopted by the Peripheria project pilots (Linde et al. 2012) are shown to involve a systematic process that moves from stakeholder enlistment and enrolment, through dialogue, to participation in innovation networks. Through this process, the living lab arena becomes populated with both people and their ideas. We identify the elements that can characterise this new urban phenomenon in service production as a means of collaborative design, development and deployment of innovative smart city services. Here we seek to bring clarity to the sequencing of the phases of stakeholder engagement and to identify the expert facilitation

and capacity building necessary to support service co-production. Our analysis thus identifies, through both theoretical contextualisation and grounding in real case studies environments—for the first time to our knowledge—the main phases of the process, their accompanying activities, and the key factors determining its effective implementation in a living lab as an open innovation ecosystem. We try to address the need for empirical verification of the relationship between stakeholder engagement and open innovation by questioning some of the underlying assumptions and contradictions hidden within the concept of a living lab's ecosystems of innovation. To aid this critique, the chapter also explores to the extent to which smart cities can themselves be understood as living lab ecosystems and we speculate on some general principles which would make them more progressive and inclusive. By offering a critical review of Peripheria project's original aspirations as well as its actual performance in the area, we have elaborated a set of lessons learnt from the current state of play in stakeholder engagement activities in the project's five pilot cities. Finally, we attempt to answer 'What is needed to make a Living lab really work?' by outlining a set of propositions about the success factors that are crucial for setting up and running successful stakeholder engagement. These propositions define both a policy agenda and a set of working practices for co-production processes in smart cities.

2   Research Framework

2.1   Underlying Assumptions of Smart City Service Development

In the context of the European approach to the smart city as a twenty-first century paradigm of urban development, the 'smart city' is no longer just about advanced technology and infrastructure. Now it is also about using ICTs to create the more sustainable and inclusive city, in which the social and relational capital are the driving powers. This reflects a belief that more citizens should be included in the building of the smarter city and that social innovation should go hand in hand with the technological changes. In addition, to increase democracy and governance in the smart city, citizens and stakeholders are expected to increase their 'say' in urban decision-making, particularly in relation to the development of public services (see e.g. Deakin and Allwinkle 2007; Paskaleva 2011; Lemke and Luotonen 2009). This conception of introducing stakeholders' social capital into the operation of the smart city constitutes a new paradigm that is closely linked with the recent interpretation of 'open innovation' as being directly relevant to 'stakeholder engagement'.

   Political science and innovation theory underline the inventive and collective aspects of open innovation, defining it as an arena of 'altruism', 'creativity' and 'sociability'. In other words: 'The act of creating for oneself and one's fellows is an act

both of self-reliance and of fellowship' (Benkler and Nissenbaum 2006, p. 409). But open innovation is not only regarded as a means of contributing to the individual and to the common good but also as 'a vital force in research and experimentation and an innovation model to create the right products and services' (Thrift 2006, p. 289) so that 'users can innovate to develop exactly what they want and need' (von Hippelm 2006, p. 1). However, as a majority of researchers emphasise the merits of open innovation for product and service innovation, it is Thrift who went further to say that the latter has also the potentials to make space active and galvanise its values: 'A shift is taking place in how the business of invention in today's capitalism process is understood. This shift leads, Thrift stated, to '[…] new fuel sources […]', which activate 'forethought', 'consumer ingenuity' and 'space', thus drawing the attention on the territorial projections of open innovation and to the need of '[…the more active use of space to boost innovation and invention' (p. 290). Taking this perspective forward means that the smart city is an ecosystem in which the citizens can come together to cocreate smart services that are closely relevant to their specific needs and desires, as well as to the functionality and quality of the places they occupy. Collaboration through working with others to produce or create things is rarely an easy undertaking. So the issue of stakeholder engagement in the co-production of smart city services has to be treated as a highly significant theme in the Smart City construct, where living labs are taken to be 'playgrounds' for open innovation processes (EnoLL n.d.).

Despite growing interest, stakeholder engagement in the smart city remains a fuzzy concept, not well defined neither in theoretical research nor in empirical studies. Various meanings have been attached to it. Interpretations vary due to specific contexts and are expressed by the use of multiple terms—'consumers', 'users', 'peers' or 'stakeholders'. Research in successful IT systems development has strongly emphasised that extensive user involvement is not only important but also absolutely essential to system success (Barki and Harwick 1991; Cavye 1995; Harris and Weistroffer 2009; Hartwick and Barki 1994). Often employed indiscriminately, the concept has been used not only to refer to different subjects and issues but also to different stages in the process too. A common assumption, however, has been that stakeholder engagement has a technological context where it means involving the users in information system development for improving system quality and ensuring successful system implementation (Pallot et al. 2010). More recently, with the growth of social media, discussion has also moved on to data creation and its wider use. Yet in the course of recent developments amongst the many EU projects on smart cities and living labs, it has become apparent that to build the smarter city, there is a strong new need to not just involve potential users but also to engage the urban stakeholders, as representative of the broader citizenry, in the processes of service development, by using open innovation models (Peripheria 2010; SmartiP 2010).

As a result, many of the new communities that are growing around smart cities and living labs initiatives are now emphasising the importance of smart citizens and their role as codevelopers, together with a need for constant improvement of the public-private-people collaboration to give an integrated (social, economic, environmental)

meaning to smart city applications and services (ENoLL 2010). Existing studies, though few, provide sufficient evidence that motivating stakeholders to get together in co-design, as an initial stage of the co-production process, has proven a considerable challenge. And so there are many outstanding questions about how better-grounded approaches to engagement can be exploited to develop citizens-driven smart city services (Draetta and Labarthe 2010; Cleland et al. 2012; Pallot et al. 2010). These are accompanied by a series of related issues about what kind of ecosystems, processes and networks are necessary for the smart cities to be driven by demand (application-pull instead of technology-push) (EC 2012). It is becoming clear that with the rising profile of the smart city in Europe and globally, unpacking and answering these questions is becoming a pressing need. In the next section we attempt to identify the key stages and factors in stakeholder engagement in the living lab to make sense of widely differing uses of the more popular concept of 'user involvement' in both literature and practice on the smart city.

2.2 Open Innovation and Stakeholder Engagement

Open innovation is held up as one of the main elements of the strategic European Innovation System, emphasising stakeholder involvement in a Quadruple Helix Innovation Model where seamless interaction and mashup of ideas are created through open innovation between academia, industry, governments and citizens in innovation ecosystems (EC 2014b). Aligned to this is the emerging new Open Innovation 2.0 paradigm which is about value creation, sustainable prosperity and well-being through deep networking and collaboration amongst all actors—here how citizens can engage and contribute to the innovation process is a particular focus of attention (EC 2014c). With the recent advancement of the living labs movement in Europe, opportunities for open innovation in the smart city have grown as well. Since the establishment of the European Network of Living Labs in 2006, more than 300 living labs cities have illustrated a desire to engage users in building up inclusive services and products to improve the quality of life of their citizens (ENoLL n.d.). Commonly defined as user-centred innovation ecosystems based on a business-citizens-government partnership (Pallot 2010), liiving labs are widely viewed as effectively enabling users to take part, not just in the research but also in the development and innovation process in cities and their regions. Using open, participative innovation, living labs can encompass societal and technological dimensions simultaneously in a 'public-private-people partnership' to develop citizens services that are more personal, optimal, and affordable, as service providers (e.g. the public sector) can find new approaches to their service provisions, so making service creation and personalisation more affordable for them as well. In this way, proponents say, living labs can act while open functional platforms where all stakeholders, including end users, can interact and new ideas can be captured in a less costly and more effective way. Benchmark examples of living labs are considered as innovation environments in which technology is given shape in real-life situations and in which (end) users

act as 'co-producers' (Cunningham et al. 2012, p. 22). So, unlike in mainstream approaches of user participation in information system development, which emphasise the involvement of the users in system usage and/or satisfaction (Bourdi et al 1986), in living labs users are not only treated as objects in the innovation process or as mere customers but also as early stage contributors and innovators (Ballon et al. 2007). In living labs all can become innovators in a co-creative process based on connectivity of people operating through their roles within a community. Users come with their different knowledge, skills, experiences, roles, points of view and needs, and all can contribute positively to the innovation process (EC 2014d).

With the recent explosion of user created content on the web, the potential for members of the general public to become co-creators of local services has exponentially increased. Thus, the living lab approach has advanced as a key mechanism for delivering the smart city Europe, based on innovation through the involvement of citizens and all other kinds of stakeholders. An earlier study of smart cities as a nexus of open innovation concluded that understanding these principles at the onset of service or product co-production is an important condition for creating and maintaining successful stakeholder engagement in the living lab (Paskaleva 2011). Beamish et al. (2012), in their book on *Trial Toolkit for User Participation in Living Labs*, concluded that what should be central to the living lab, as opposed to other R&D innovation labs, is their openness, influence, value and sustainability (p. 22). Regretfully, however, they failed to deconstruct the concept in a way that can be useful to those who wish to engage with it seriously. Below we attempt to operationalise this concept. In the literature on system development research, there is an abundance of methods for involving users on offer—such as lead user (Von Hippel 2006), user-driven innovation (Von Hippel 1986), user-centred design (Von Hippel 2006), and user-created content (O'Reilly and Battelle 2008). But there are none so far for stakeholder engagement in the domain of living labs in the context of user co-creation research (Prahalad and Ramaswamy 2000). On the other hand, stakeholder theory suggests that understanding stakeholder engagement requires evaluation of the nature of the multiple interactions and interdependencies between and amongst the stakeholder groups involved (Gould 2012). Frooman (1999, p. 192) underlined the importance of evaluating the relationships between the multiple actors. Rowley (1997) discussed stakeholder theory in relation to social network theory and distinguished between various network configurations. Zietsma and Winn (2008) and Lewric et al. (2007) went further and argued that networks of stakeholder relationships are complex and nuanced. Participants in a stakeholder network may have significant interaction with other participants outside the control of the focal network, implying that these relations should also be studied as part of the process. Lamberg et al. (2008) pointed out the significance of path-dependence in stakeholder relationships, underlining the importance of both initial conditions and the sequence of events that transpire. This aspect is of particular interest to our current research. Clearly, what seems most important here is to identify the key principles of stakeholder engagement, map out the different stages that need to be worked through and the activities that need to be undertaken, and then delineate the mechanisms and forces that keep the process and the structures going, in a

sustainable and effective way (see Sloan 2009 and Pamela 2009). This leads us to the question: what is needed to make this process work effectively?

In many traditions within service or product development, and in other design domains, a major focus for user involvement is on testing and evaluating, with the implication that users come in later in the development process, that is, when there is already something to test. Fundamental to the living labs' approach is to engage users at the very beginning so that they can act as co-designers as well as co-developers. There are strong reasons for trying to achieve this. Not only are there benefits from insights into user preferences but also, and even more important, it can help deliver a more committed level of engagement. Thus, we need to distinguish between 'involvement' and 'engagement' in the living lab.

Twenty years ago, Greenbaum and Kyng (1991), when studying cooperative design of computer systems, came up with the idea that 'user participation does not mean interviewing a sample of potential users or getting them to rubber stamp a set of system specifications. It is only recently that studies start to recognise that the active involvement of users in the creative process, called 'design', is really what matters. Ståhlbröst (2010) also noted that '[ ]…the participation concept is imprecise, and techniques claiming to be participatory treat users as sources of information instead of equal partners' (p. 14). But it was Kviselius and Anderson (2009) who argued that, in the living lab, it is not only users who should be involved: 'Activating of not only customers but also other relevant user groups like staff of living lab partners is a way to increase input of ideas into the innovation process.' (p. 84). Yet, to date, general citizens remain marginal to the scope of how living labs have been operated.

User incentives are considered focal to the process. A living lab should aim at providing user incentives relevant to a specific stakeholder group to increase the range of submitted problems and solutions from these users. Self-fulfilment and learning, joy of everyday innovation, career progress, the call of duty and being part of a bigger whole have all proved to work as strong motivators for user contribution to innovation. Yet in the living lab, the key question about the 'real incentive' to get stakeholders to engage in co-production remains poorly framed. If it was better understood, then perhaps it would not be so difficult to get people to join in co-production activities. Co-production was first mooted when Finland held the EU presidency in 2006. Critics said that it was simply a ruse by which Nokia got its customers to tell them what services they wanted, got them to help design these for free, and then sold them back to the customers. All this suggests that one should not be too dewy-eyed about co-production.

A number of recent studies have delineated various important elements of engagement. Hart and Sharma (2004) showed that engaging fringe stakeholders for competitive imagination is also important for competitive product design. 'Rather than engaging only known or powerful stakeholders concerning existing businesses, such an approach instead seeks to systematically identify, explore and integrate the views of those on the periphery or at the 'fringe'—the poor, weak, isolated, non-legitimate, disinterested and even non-human' (p. 8). The authors offered a 2-step method for involving both powerful stakeholders as well as silent

voices: (a) *Fan-out* in which boundary spanners engage core stakeholders including suppliers, customers, distributors, local communities, NGOs and government agencies to identify further networks of these core stakeholders and the possible negative social and environmental impacts of the operations of each stakeholder in the network and (b) *Fan-in* where close interaction with fringe stakeholders within remote contexts is encouraged to generate new product ideas and business innovations and to transfer tacit knowledge (p. 15). What is more, the authors also suggested that 'stakeholder networks' have to be established that will engage with both the powerful and silent parities. What was not mentioned, however, was that conventional managers, unlike intermediaries who deliberately seek to span group boundaries, do not easily seek stakeholder engagement. Thus, a key question becomes 'How to get managers to do that?' But they left this question unanswered. How to create a will amongst managers for engaging stakeholders with silent voices is another aspect that needs to be explored as well.

Willingness to engage is embedded in the issue of value creation and the benefits that this brings to the individuals and stakeholders involved. The perceived value added of co-production in the living lab, starting with the co-design, has multiple dimensions. In the smart city, the value added to the citizens participating in 'co-production' is that they have a real incentive to become more involved as 'co-producers', as well as 'co-users', of the content and the services available. By doing so, they have access to creative communities, acquire new skills, employment opportunities and service choices that address their real needs and wishes, potentially leading to a better quality of life and better places to live in. Generating long-term benefits also requires making co-production more sustainable and resilient in both time and in terms of relational capital, by embedding a sustainable engagement of citizens in all aspects of the innovation process. Fostering new standards of mutual stakeholder partnership so that people are recognised as assets, and so that their work to make the city more sustainable and socially just is valued, should become a key yardstick. From this perspective, sharing responsibilities for providing local services between public authorities and local citizenry offers a new rationale for making 'public-private-people partnerships'—seen as a viable and desirable leap forward (SmartiP 2010).

Alongside these trends, and the modes of citizens engagement that shape the urban open innovation ecosystem, new forms of 'urban governance' need to occur as well. In 2008, in an effort to draw up the essentials for living labs, Mulder et al. (2008, p. 4) wrote that 'the governance perspective is key to user involvement'. According to them, 'governance' deals with the organisation of the living lab as a whole as well as the interactions between its constituent members. Examples are the commitments and responsibilities accepted by members, financial arrangements for the joint infrastructures, as well as mutual arrangement in respect to using each other's technologies and services. Aspects surrounding priorities for the living lab as a whole and future directions are also part of this perspective. The openness or the closeness of the living lab to other parties, and the amount of public and private funding invested in it, are other key aspects. Last but not least, contextual issues dealing with the overall management structures and the goals of the organisations

involved—whether research driven, innovation driven or business driven—also need to be considered. In addition, as Kviselius and Anderson (2009), in dealing with living labs as tools for open innovation, found out that '[ ]…potential frictions amongst the stakeholders can be handled through emphasizing early discussions among them and putting governance processes in place, including various legal scenarios for commercialization of open innovation products' (p. 90).

Overall, what these authors have emphasised is that 'governance' principles—such as openness, fairness, accountability and democratic decision-making, to mention only a few—should be applied throughout the whole process of stakeholder engagement so that open innovation can facilitate successful co-production activities in the living lab. Otherwise, as Froessler et al. (2007) noted, 'In absence of an overall strategy and related governance structures, other sources of legitimacy and a mandate are needed' (p. 17).

2.3 Applying a Living Lab Approach to Stakeholder Engagement in the Development of Smart City Services

Having looked above at the context of the engagement process and its relationship with open innovation in the living lab, this section attempts to unpack the concept of stakeholder engagement further by embedding it in the phases of producing open innovation smart city services and particularly in the activities leading to successful service co-design. Existing literature on the topic is strikingly limited, constrained primarily to highlighting the importance of 'user involvement' or 'stakeholder collaboration' in the various processes of creation, exploration, experimentation or evaluation—or, as others see them in inception, definition, operation and completion of service development (Carter 2011). Similarly, the vocabulary used about the processes involved varies tremendously—from 'co-production' to 'co-development', 'co-design', or 'co-creation'. All these are in current use and all have different overtones. In this study, the term 'co-production' is preferred because it suggests the development and the deployment of innovative ideas, in which co-design is considered the first step of bringing people and ideas together in a co-creative process (joint innovation). This approach is consistent with a recent high-profile NESTA report on the future of public services in the UK (Boyle and Harris 2009) which revealed that co-production offers a revolutionary way for citizens to participate not just in the design but also in the delivery of services by contributing their own wisdom and experience in ways that can broaden and strengthen services and make them more effective.

In this chapter, we draw on the findings of Mulder et al.'s recent work (2008) to identify the essentials that make a living lab harmonised, from an organisational point of view, by motivating users to participate in the design process because of the individual advantages they each achieve by being part of a living lab. The contextual issues, as they called them, are those that deal with social networking aspects and all kinds of cultural and legal differences between them and the settings. More

importantly, as Schaffers et al. (2012) added in the FIREBALL White Paper 'Smart Cities as Innovation Ecosystems Sustained by the FI', '[ ]…despite the growing rhetoric, there is in fact little evidence that smart cities are realizing their visions first, and even more so there is a lack of attention to engagement and empowerment of citizens, SMEs and other entities realizing their needs or ambitions, and of how citizens are empowered to participate in urban development and social innovation in general' (p. 57).

Clearly, putting more emphasis on stakeholder engagement in the early stage of service development is one key element to setting up effective stakeholder innovation networks. But once the environment is created and the collaboration is initiated, can we just snap our fingers and say 'innovate'. This is unrealistic, given that many stakeholders will have never worked together before (Froessler et al. 2007, p. 17). Supporting the generation of new ideas across a heterogeneous collaborative workspace—the urban ecosystem—is a process that requires sharing of the principles, structures and a common agenda in a continuous process. But as this process seems complex, using unobtrusive methods for seeking harmonisation is essential (Mulder et al. 2008).

In order to maintain working stakeholder collaboration, the role of intermediary, 'knowledge brokers' appears fundamental to the different stages of the engagement process. In the living lab, stakeholders can be drawn into experimentation through targeted approaches by local authorities and associations or by universities and businesses, as multipliers and mediators for indirect recruitment. Activities can focus on mediation and translation between network actors, who may have different interests and different understandings of the problem domain. Though in the initiation stage, only limited number of people can be involved in setting-up a shared understanding of the project, a larger group of people, representative of the different organisations (and interest groups) concerned should be brought to the process, to start the sense-making process (Froessler et al. 2007). This brings two key questions to the fore in the context of a living lab: Who can act as a knowledge broker and who has the capabilities to perform this role? And from which of the parties present—the developer, the city or other stakeholder groups—should this knowledge broker come?

There is also the issue of good project management necessary for making the purpose of co-design clearer and productive. As Levén and Holmström (2008) discerned, consumer co-creation and the ecology of innovation in the living lab depends on establishing active process management from the very start of the joint activities. This is needed to make sure that the essence of the open innovation co-production project is indeed the co-evolution of the network of actors, and affected by any individual actors. The essence here is that 'good management' makes both the benefits to stakeholders and what is expected of them is clear from the outset. Nontechnical participation activities at the initial stage of smart city service co-design appearing are also critical for bringing the stakeholders together (Bergvall-Kaareborn et al. 2010): 'A recurring challenge within participatory design concerns how to communicate the needs of users in such a way that developers can understand them while, conversely, developers need to be able to feed back their understanding of system requirements in a manner such that the users can make sense of it. Therefore

nontechnical participation activities, such as paper-based techniques or open debates, should take place rather than just producing technical prototypes. The process can involve various types of engagement, including focus groups, questionnaires, diaries, and picture-taking, to collect different types of data and also to allow for different formats for user contributions'. As this quotation makes clear, boundary objects (whether paper- or image-based or even vocalised) have to be constructed that are both meaningful and acceptable to all of the parties that are seeking to collaborate. This is necessary because, in the absence of such shared boundary objects, one or more group of stakeholders may feel that they are being marginalised or excluded from the epicentre of co-production decision-making (ibid, p. 324). And since living labs mostly evolve around the use of technologies in the development of products and services, the effective usage of electronic collaboration tools with an emphasis on simplicity and iterative feedback-loops are crucial for inviting users into the living lab open innovation process.

To help cities that were struggling on this front, the Peripheria project developed representation of an open innovation service presented in Fig. 1.
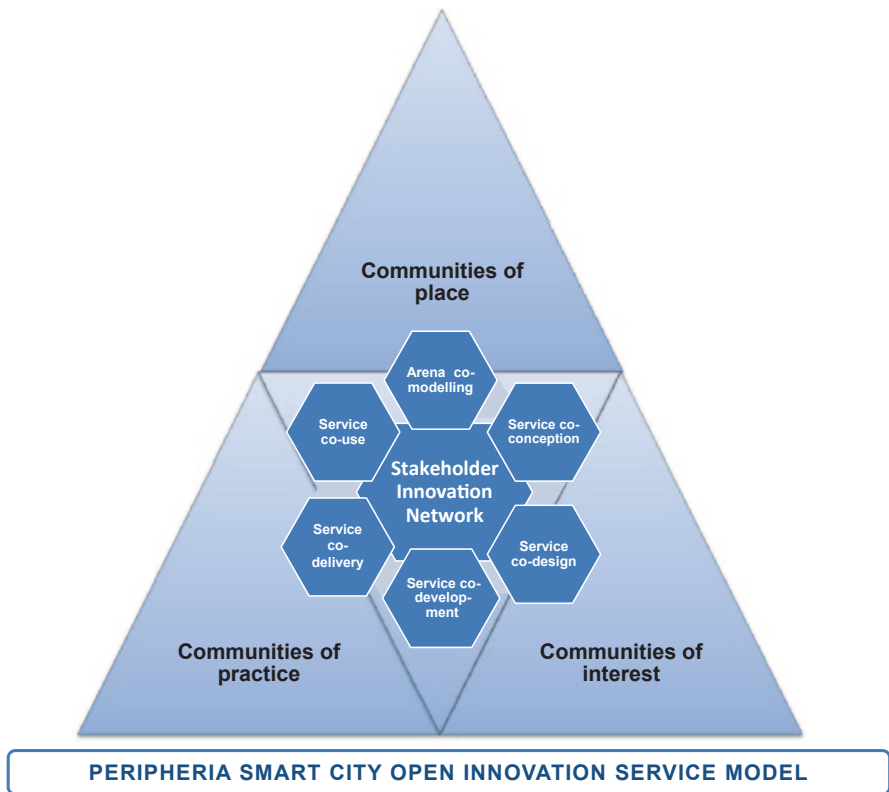
Fig. 1 Peripheria smart city open innovation service model (Paskaleva 2012, p. 9)

This model allows a focus on both process and product—the development of a specific service—aligned with the stakeholders and their networks. In this way, the Peripheria Model illustrates the inter-dependency in the process between the co-production of concepts, design, development, delivery and use. These are revealed as components of a self-sustaining co-evolutionary process that can provide for outcomes of the services, real and/or potential, that are desired by the citizens.

3 Methodological Approach

Based on the proceeding theoretical analysis, a path-dependant and forward look-ing process diagram for stakeholder engagement leading to service co-design is proposed for this study, presented in Fig. 2:

As Fig. 2 illustrates, there are four main steps of stakeholder engagement which are key to successful service co-design.

Step 1 Stakeholder enlistment (i.e. identification and enlisting of stakeholders who need/wish to be engaged).

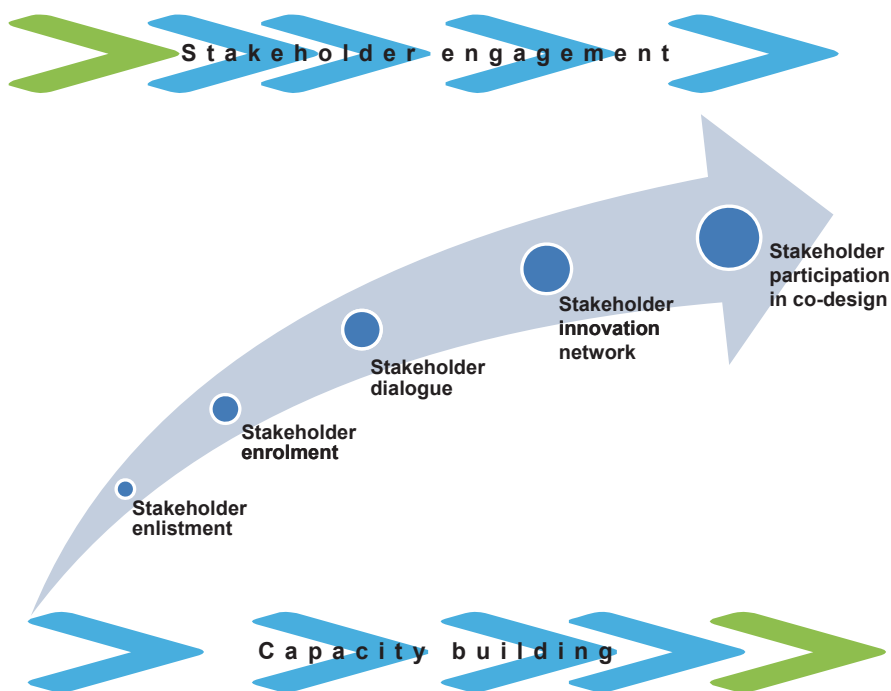Step 2 Stakeholder enrolment (i.e. approaching stakeholders and persuading/ motivating them to become involved).

Fig. 2 Smart city stakeholder engagement process in the living lab leading to co-design

Step 3   Stakeholder dialogue (i.e. introducing stakeholders to each encourage them to talk to each other with the objective of constructing some sort of consensus (shared vision, scenario) about what needs to be done).

Step 4   Stakeholder innovation network (committed stakeholders and actors form a coalition for working together on an agreed agenda and process of service co-production, leading to active co-design).

This sequential approach is based on an appreciation of the need for a parallel set of stakeholder capacity building activities supporting engagement from the start which enables stakeholders to co-design smart city services by developing their skills, knowledge and techniques for collaborating and co-producing. This sequencing allows for the analysis of, and support for, the multiple steps in stakeholder engagement leading to successful co-production. The approach also draws attention to the need to identify the roles of stakeholders and to finding out the key drivers of their willingness to engage in a participatory co-design process. Finally, it signals the importance of those factors that sustain and enhance their engagement throughout the process—whether they represent institutions, communities, whether they are present as organisational leaders and motivators, or acting as intermediaries.

By attempting to track how, in practice, such stakeholders were enrolled and engaged in a dialogue, and why certain types of forms and events were used by the Peripheria pilots, we aimed to learn more about how sustainable engagement of the urban stakeholders in the co-production of smart cities services can be successfully facilitated.

4   State of Play

4.1   The Peripheria Project

The objective of the Peripheria project (Networked smart peripheral cities for sustainable lifestyles)—an initiative funded by the European Union's Smart Cities portfolio of projects, which ran between 2010 and 2013—was to deploy convergent FI platforms and services for the promotion of sustainable lifestyles in emergent smart cities in Europe. A guiding principle of this action research-based project was that if smart cities are to deliver a better quality of life in more attractive urban areas, new ways of engaging with citizens need to emerge not just to provide them with better access and inclusion but also to empower them as a catalyst in transforming the dynamics of the development and management of city services. Attaining these goals required adopting sustainable methods for involving urban stakeholders, using *bottom-up* approaches and living labs methodologies. Peripheria's FI Platform is convergent with *social interaction* being central*, occurring at the 'run-time' moments in which infrastructures and services can be jointly and dynamically discovered, invoked and composed, in concrete situations and places (Paskaleva 2011). In Peripheria, social interactions occurred around and within var-

ious urban ecosystems, called 'Arenas'. These were considered as particular types of urban settings, each with their own social, economic and environmental attributes and infrastructural characteristics where technological and social innovation blend, and where multiple actors participate to co-create the services they want, by driving the convergence of technologies and applications based on their needs and wishes (Peripheria 2010).

From an urban ecosystem perspective, a city street, square, park, or a neighbourhood can be labelled as an 'Arena'—seen through its past, presence and future, as a mixture of urban fabric, local communities, events and activities. It is in such arenas that urban policies become coupled with the specific aspirations and wishes of citizens about their wellbeing now and in the future. In the Peripheria Arenas, these elements came together, driven by citizens' and/or policy-makers' initiatives—called in the project a 'Challenge'—so that problems were clearly understood and key stakeholders were engaged and their contributions defined. These Challenges developed shared visions of new services and applications that could be launched to co-produce new smart city services (Marsh 2013, p. 13). In the participating cities, service co-production occurred in five archetypical arenas:

- *Smart Neighbourhood*: where media-based social interaction occurs (Malmö, Sweden)
- *Smart Street*: where new transportation behaviours develop (Bremen, Germany)
- *Smart Square*: where civic decisions are taken (Athens, Greece)
- *Smart Museum and Park*: where natural and cultural heritage feed learning (Genoa, Italy)
- *Smart City Hall*: where mobile e-government services are delivered (Palmela, Portugal).

By using a citizen-centric, discovery-driven approach, each arena was treated as a space where smart city components came together to initiate co-production processes for new urban services. But different stakeholders groups—civil servants, citizens, academics, business groups or ICT providers—did not have to all come together in one single place or process: rather they constituted an innovation network that could be drawn upon when demands from citizens came. Understanding when, where, as well as who should get engaged, was found to be key for making an arena active for co-production. Achieving this posed many problems as described below.

4.2 Setting Up of the Pilots

The following analysis draws on the stakeholder engagement model proposed above. Both the process and the activities of the pilot cities are the focus of attention here. In practice, engagement with stakeholders in the each of the cities' arenas was launched in the absence of a comprehensive understanding of what this approach needed to involve. The current study occurred as a result of the demands and

the problems that the cities started to experience in setting up their co-production process. As such, it looks backwards to reflect on those developments and their results as reported by the pilots themselves.

4.2.1 Stakeholder Enlistment

To identify the relevant stakeholders in each of its pilot cities' arenas, members of the Peripheria project found that creating a 'smart citizens' community'—to bring together citizens, government and developers—was an effective mechanism for achieving the goals of creating new, dynamic, and viable networks and relationships in the smart city. This approach built on the notion that, when local organisations and other types of stakeholders are well-connected within their communities, they can bring detailed and locally specific knowledge, and a grounded understanding about local needs and how they can be met, as well as access to local assets and re-sources. This experience led to the suggestion that stakeholder engagement should involve not just key experts and institutions in the field of smart city services but also a variety of different kinds of communities of stakeholders:

- Communities of place (CoP) (e.g. resident associations)
- Communities of interest (CoI) (e.g. sports associations and environmental groups), and
- Communities of practice (CoP) (e.g. educational groups and university departments)

In the Peripheria project, communities of place were expected to act as the "champions" of mapping exercises because they were expected to be located directly within the arenas, physical spaces of the city. Communities of interest and practice possess spatial boundaries, but these may extend further—regionally, nationally or even internationally. Involving each kind of community in the (networked) pilot framework and platform meant asking participants located in the arenas to help identify other major stakeholder groups that would need to be engaged in co-production of new services (Cooper et al. 2011, p. 35).

In the early stages of the project, a general framework for stakeholders' identification was developed (this was later called upon for evaluating Peripheria's success) (Cooper et al. 2011). The aim here was to show the range of stakeholders, pilots had identified as key actors to be involved in their smart city arenas. A list of the stakeholders was built in each arena through an exercise started at Peripheria's first Plenary Meeting in Genoa in February 2011. Representatives of each pilot city were asked to identify whom they currently saw as major stakeholder groups that would need to be engaged through co-production activities conducted in their respective arenas, including both:

- Stakeholders that influence decisions, and
- Stakeholders impacted by decisions (typically taken by others).

The intention here was to make city pilots' representatives explicitly aware that these categories are not discrete and that in the context of the living labs, both 'powerful' and 'silent voices' needed to be considered. The stakeholder groups identified through this exercise are shown in Table 1.

As Table 1 reveals, all pilot cities intended to engage multiple groups of stakeholders in their co-production activities. Malmö and Athens were seeking to engage with most and Bremen with least. However, this only refers to the different types of stakeholder groups that each pilot was seeking to engage. Bremen, for instance, planned to engage a wide range within a specific stakeholder group—business organisations. All of the cities were seeking to engage with high-level city officials, especially Athens, Genoa and Palmela. This reflected the central position of city administrations in these pilots. Most were also focused on engaging citizens, particularly residents. At that time, only Bremen declared a specific interest in engaging with visitors to its Arena (in the form of shoppers). Later Genoa did so, since its Arena was a museum open to visitors—both local residents and tourists—in a public park.

Locally based citizens were identified as a key stakeholder group in all five arenas. Individual businesses and business associations were mentioned frequently, with the former being perceived as harder to engage than the latter. Only one type of community of place—residents' associations—and one type of community of practice—educators—were cited in this early stage. Both were seen as relatively easy to approach and engage. Most of the other types of organisations cited were only identified in one pilot each; such communities of interest, it was expected, would be relatively easily to access and engage. Two stakeholder groups were identified as difficult to access and/or engage—young people and ethnic groups.

In the initial phase of stakeholder engagement, the most common approach used by the pilots was to start enlistment activities using established networks and contacts and then evolve the network by adding new contacts over time. When a new stakeholder group was included, its networks of contacts were often approached. One example is how WFB (the Economic Development Department) in the Bremen pilot helped to establish contact with the Lloyd Passage Management Association to develop the new services. In a similar way, the Athens pilot started with staff working within the municipality and used their contacts to reach out to external groups, networks and communities; for instance they recruited a specific volunteer team as a contact to minority communities. The Malmö Pilot also used previously known stakeholder groups such as the 'The Voice and Face of the Street' organisation (RGRA) to make contact with other stakeholders such as the Herrgårds Women Association.

4.2.2 Enrolment

One major challenge that the pilot cities faced was how to motivate stakeholders to get involved in co-production activities. Agreeing to the 'shared outcomes' was seen as one way forward. Early on in the engagement process, an effort was made to

Table 1 Initial list of major stakeholder groups in the Peripheria Arenas

Pilot cities	Athens	Bremen	Genoa	Malmö	Palmela	Total
Arenas	Square	Street	Museum in park	Neigh' hood	City hall	
Types of stakeholder groups identified						
Government organisations and departments			□			1
Mayor's office	□		□	□		3
Elected city council members	□		□		□	3
City council departments/officers	□	□	□	□	□	5
District/street office					□	1
Transport agency						
Housing co-operative				□		1
Developers, financiers			□			1
Residents' association (CoP)	□					1
Women's group (CoI)				□		1
Environmental group (CoI)	□		□			2
Labour association (CoI)				□		1
Business association (CoI)	□			□	□	3
Educational group/university department (CoP, CoI)			□	□		2
Young people's organization/university students (CoI)			□	□		2
Ethnic group (CoI)	□			□		2
Faith group (CoI)				□		1
Charities and other voluntary groups, including NGOs	□		□	□		3
Other public or civic bodies or agencies (hospital, theatre, tourism)	□	□				2
Businesses		□			□	2
Citizens (residents)	□	□	□	□		4
Visitors (tourists)		□				1
Community interest group (unspecified)				□	□	2
Totals	10	5	10	13	6	

identify what desired outcomes stakeholders were seeking against five main catego-ries of success that Peripheria had set up for evaluating for its services—wellbeing, prosperity, privacy, security and governance (Cooper et al. 2012, p. 36). The project used these desired outcomes as proxy indicators for what motivated stakeholders to become involved.

Members of the Project's Social Innovation Strand identified, through an all partner exercise, a wide range of 'desired outcomes' being sought by their most significant stakeholder groups. These ranged from 'people feeling that their voice is being heard', to 'improved safety and security/and 'an increased sense of belong'. Each of these desired outcomes was expressed in the form of an imperative to in-dicate that this is what the co-produced FI services would have to deliver to meet stakeholders' desires.

Establishing specific 'desired outcomes' as success criteria in each of the arenas was considered an important next step. In Athens, for example, stakeholders agreed on a set of desired outcomes such as:

- Being counted
- Being heard
- Becoming more green in their everyday lives
- Becoming proactive and actually participating in co-design procedures
- Forming a new living lab

Subsequently, these desired outcomes were used as key success indicators. Narrow-ing down was sometimes necessary. For instance, in Bremen 'well-being' was taken forward as a desired outcome as access to 'Information Lounge about occupation of special parking bays and local surrounding of a car park'. Key indicators for this were:

- Time saved for finding free parking bay
- Amount of reduced stress during parking bay finding
- Number of interesting events found through Information Lounge.

As work in the arenas progressed, the stakeholder groups represented in Table 1 changed and grew. More stakeholder groups were identified as significant and so attempts were made to enrol them. Cities also tried to engage more actively with those stakeholder groups that they had identified as 'silent voices' or 'hard to reach', such as workers, tourists and immigrants. Using personal communication and face-to-face meetings for the 'enlistment' of the stakeholders built better stakeholder networks because it is not easy to enrol people in activities that were beyond their everyday experience. Building trust in network relations called for using available personal contacts at the start and then 'snow balling' to gain further contacts. In two of the pilots (Athens and Malmö), the role of digital communication platforms and social media increased as pilot activities intensified.

Contextual differences and city-specific objectives had to be taken into account by pilots in deciding which strategies for stakeholder engagement to use: no 'one-size-fits-all approach' was applicable. In Athens, for example, invoking a co-design

and co-development process that went beyond the client/consultant model arose as an important sustainability principle. The objective of their Smart Square Arena was to create a new open innovation service model. The city worked on stimulating stakeholder activities through existing client/consultant structures and processes, even while adding new actors. In Bremen, some stakeholders (e.g. the shopkeepers' association in Lloyd Passage and the Tourism Department) identified synergies for collaboration involving leading edge technology and/or potential business opportunities. Palmela needed to include representatives from rural areas so addressing local issues with local people was targeted as being of primary importance. In Genoa, accounting for and taking advantage of the specific cultures of the different city offices—along with their existing capacities—meant that engagement within their 'back office' was seen as a first and essential step for ensuring that appropriate external stakeholders could then be brought in.

4.2.3   Dialogue

Getting to know each other and building mutual trust was considered one of the most important issues in the early phases of stakeholder engagement. Just how the cities did this varied considerably. Most initially they focused on discussing online participation with their stakeholder, such as using blogs and social networked media available in their arenas. Malmö, engaged directly with its stakeholders in their existing real-life activities first. Then, as their activities progressed towards service co-design, issues of access and availability of online information were addressed. Online forums, such as Facebook groups used by the climate coaches at the housing co-operative in Malmö, proved of the effectiveness of piggy-backing on already established platforms. This happened in Bremen too. Here, at the suggestion of the Tourism Department, 'Bremen.de'—the local web presence for Bremen—was used to reach out to citizens. Malmö also used the municipality's website as a springboard for public discussions on open innovation issues relevant to developing new services. The main aim here was to understand stakeholders' needs and desires for new services, while building trust amongst them through social interaction and participatory activities. Unobtrusive methods of data collection were used, such as intimate face-to-face meetings where stakeholders engaged in co-modelling their arena's 'Challenges' and linking them to their visions and strategies for the new services, through shared user scenarios and cases.

Technologies, particular ICTs, played a key role in engaging stakeholders in all activities of the pilots. For instance, in Bremen, stakeholders' participation grew as they became involved through workshops in testing and experimenting with new concepts using ICT (e.g. mobile end-devices). Conversely, Palmela worked through focus groups on automotive and e-government technologies as the centre of gravity of its workshops. Using technologies, the pilot cities stimulated their stakeholders to work on three specific themes:

- *Demo-ing* mobile end-devices in Palmela and in Bremen. In Malmö, where many stakeholders had limited technological literacy, a technology developing company was invited to workshops to demo not only ready products but also prototypes. The 'imperfectness' of these provoked co-design aspirations amongst participants on how to improve them.
- *Co-creating scenarios* was central to the approach adopted for developing Peripheria's new services. In Malmö, the delivery partner MEDEA, set itself the goal of co-creating a repository of scenarios to motivate and drive its participants' engagement. Small group brainstorming techniques were used to generate scenarios at a 'Girls' Design' workshop by students and other working with municipality officers and another with climate coaches from housing co-operative. Other pilots undertook scenario building later on, after the establishment of the Peripheria Convergent FI Platform, and mostly enacted them online rather than face-to-face.
- *Public experiments* were also used to drive stakeholder engagement. For example, in Malmö, a public experiment was designed with young people from a particular neighbourhood area using a simple SMS engine for mobile gaming. Performing these games provided a narrative, which was then iteratively referred to by many different stakeholders. Stakeholders' motivations differed; some were interested in potential business models, some in the social interaction the games provoked, and others in the technology itself. The game prompted them to reflect on their practice while using technology to explore models for open innovation leading to more sustainable lifestyles.

The knowledge gained through using technologies was also relevant for other formative purposes. For example, conducting public experiments meant that participants were also enacting their values. Tackling the question 'What shall I do?' gave expression to their intentionality: this might be congruent with what already existed or expressed deviation from current normative practice.

4.2.4 Innovation Network

Pilots differed in how successful they were in engaging with stakeholders through their living labs. Malmö demonstrated consistence in using its networks to create ideas and scenarios collaboratively amongst its participants. In the other arenas, groups of stakeholders might more accurately be described as having used their interaction to pursue their own self-interests. Malmö benefited here from long-term relationships. It ran a living lab before the Peripheria project. Once the project was launched, the co-design of the arena scenarios 'travelled' between different alliances and activities in its already established networks, gaining new meanings as they were interpreted and appropriated by new sets of actors. The Fig. 3 below illustrates how its innovation network was set with stakeholders who each had their own agendas, but displayed a readiness to enter into alliances working on specific and shared challenges through a dedicated development process.
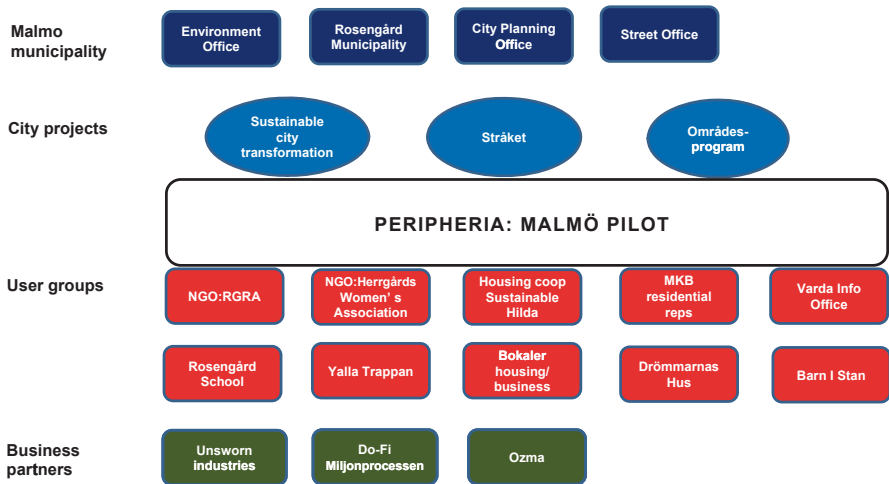
Fig. 3 Malmö stakeholder innovation network

4.3   Interpretation of the Results

The experiences the five pilots had engaging with stakeholders in their specific arenas varied. This variation reflected their different cultural and political contexts, the institutional affiliation of their lead partners, as well as in the practices they adopted to manage their co-production processes. All of the pilots sought to promote engagement. But, beyond the enlistment stage, MEDEA (the project partner in Malmö) was recognised as being the most successful because of its previous experience of employing a range of techniques and methods such as brainstorming, focus groups, design oriented workshops, the public experiment and planning meetings (MEDEA n.d.). Its strategy of aligning its project activities with its stakeholders' existing interests proved effective for building collaborative scenarios, including alignment with projects that the city of Malmö itself had initiated for example, 'Sustainable city transformation; 'Stråket' and 'Områdesprogram' (see, e.g. Malmö Stad n.d.). Developing new services aligned with the work of other business partners and with the aims of different user groups such as NGOs also proved effective. Such alignment meant that the pilot tapped into the energy and motivation of such stakeholders who were able to continue to concentrate on their everyday concerns while collaborating on the project. Not moving far away from what they already were doing, made it easier to start the project quickly. MEDEA recognised that, because people were busy, it would have been difficult to involve them in an entirely new project. Experience showed that this rang true for Peripheria's other pilots as well.

Each of the Pilots needed to collaborate effectively with their stakeholders through all four steps outlined above. Early in the project, it became clear that doing so was presenting them with real difficulties. In February 2012, during a Peripheria

Project Management meeting, a workshop-based formative evaluation was carried out with the pilot city partners, aimed at developing a forward plan for co-production activities for each of them. The workshop was also used to identify what each Pilot was finding most difficult about establishing and running their living lab effectively. The evaluation revealed that there were major differences in the difficulties facing each city. In Athens, 'the most difficult thing to date has been to get stakeholders to come to the table because of the lack of 'proof' of a concrete e-service and Platform to demonstrate to them'. In Bremen, 'the problem here is that it is difficult to get motivation and engagement 'for free'. In Genoa, 'one of the main difficulties is that people have no awareness about or sensitivity to the opportunities offered by a Living Lab'. This last statement gave voice to a general difficulty. It is not easy to establish a living lab and to get people to take part in co-design if they do not understand what co-design or a living lab are. And, if they do not know what the product of co-design will be, or if they do not understand what is in it for, then stakeholders may have little incentive to collaborate.

Building stakeholders' capacity to take part in co-design requires appropriate tools and techniques so they can be encouraged to work together collaboratively on the shared design of desired services. In this chapter, we have argued that these four steps outlined above are substantively different areas of activity, effective deployment of which each requires specific skills and expertise. Analysis of the pilot cases showed that the leaders of pilots had explicitly recognised Steps 1 and 2. They had implicitly assumed Steps 3 and 4, but without acknowledging that specialist skills and expertise were needed to implement them effectively. Rather, they had been led to assume that if pilot city partners could identify the relevant stakeholders and convene them, then (without any further guidance or support), they would be able to make a living lab/co-design appear. This notion found explicit expression in an early suggestion from the Project Management Team that:

- 'When you have a large number of stakeholders at the table, you have a Living Lab' (Cooper et al. 2012, p. 38). Experience gained on the Peripheria project amply illustrated that this simply was not the case. Steps 3 and 4 need to be as actively managed and facilitated as Steps 1 and 2.

4.4   Propositions for Stakeholder Engagement in the Smart City Living Lab—Setting Up the Founding Framework

Through our experience on the Peripheria project, we have been able to identify nine working assumptions—'propositions' that need testing—for more effective stakeholder engagement in co-design of services in living labs. Given the slender experience base currently available for generating these propositions, let alone for testing them, their underlying assumptions need to be treated with caution. Those seeking to apply them would do well to subject them to SWOT analysis to see how well they might operate in their own particular circumstances.

When establishing a living lab, it is not enough just to understand the everyday practices and needs amongst stakeholders being brought together. It is also essential to build mutual trust that extends outside specific project activities. Moving beyond simple enlistment towards meaningful engagement in co-production activities makes it necessary to include stakeholders, not as mere users—consumers of services provided—but as empowered actors. Strongly engaged in their co-design, co-development, co-implementation and co-evaluation. Their needs and desires have to be understood from the beginning. Just as important, during the engagement process, mutual trust should increase, so unreasonable or false expectations have to be explicitly managed so that stakeholders' levels of commitment can grow. These requirements frame our understanding of when actors should be involved, as well as about the degree of involvement required. This is formulated in our first Proposition:

1. Involve stakeholders early in the process, before projects are clearly formulated. Work together on joint articulation of aspirations and concerns as a starting point.

Identification of 'needs' and 'problems' to be addressed should include exploring potential not yet realised through a mutual learning process that gives co-designers and co-developers possibilities to learn and understand each other's practices and wishes. Stakeholders can learn about how to increase their own potential through interaction, not only with technologies and services but also with other collaborators in the living lab being set up. An iterative learning process is clearly implied here as necessary for a living lab to progress and evolve. Engaging a wide range of diverse, but complementary stakeholders is also important so participants can see how their interaction with others enriches their own skills and capacities. They also can then foresee an action space that increases their own potential by collaborating with differently situated actors—each profiting from continuing and deepening their engagement with one another.

2. Engage users with diverse backgrounds, competencies and agendas and stress how, through their collaboration, they will complement and learn from each other.

Each group of stakeholders' motivational drivers for engaging have to be identified. The living lab needs to ensure that each set of participants should be able to gain by taking active part. Mapping out their interests and their potential gains from engaging is critical here, as is understanding their everyday activities and concerns, their agendas and interests, their membership of other communities of place, practice and interests, along with the knowledge, resources capacities that each one will bring to the network. Tease out what they each expect to gain from collaborating along with any potential conflicting interests that might arise.

3. Identify and work upon what participants can gain from taking part. Active engagement rests upon how beneficial it proved to be for each individual partner.

In the early phases of co-production activities, it is important that specific individual stakeholders' interests are not allowed to become dominant. Activities have

to be facilitated that make sure that those interests are rewarded, but the focus has to be on getting everybody's voices heard and on how participants can strengthen and support each other. A balance between 'top-down' (civic interests) and 'bottom-up' (other stakeholder interests) in co-production activities has to be sought. However, for a living lab to have impact, stakeholders that are close to ('top-down') civic decision-making have to be brought on board, especially when aiming at behavioural changes to extend the project's impacts beyond its lifetime.

4. Assure different levels of impact, both in terms of the direction of political decision-making and significance for other communities represented by influential participants.

Conflicting interests and other factors that could potentially derail co-production activities should not be overlooked. These need to be dealt with constructively, leading to a better understanding of how to keep different stakeholders engaged. This can help, for example, when focusing on the relationship between those stakeholders capable of influencing decisions and those affected by them (but lacking such influence). Björgvinsson et al. (2010) stressed how underlying rhetoric in innovation often focus on the market economy, which increasingly thrives on the speed of producing novelty products, and which is treated as if it were a precondition for democracy. Defining what innovation is, quite who innovates, and where and under what conditions innovation occurs—all of these are part of an important battleground over decision-making within society today. Such issues need to be handled with sensitivity, if potential conflicts are not to limit, not just the internal structure of a network but also relationships between participating actors to those outside of the living lab. More than just economical rationales need to be considered here: there are also ethical issues about trust, informed consent and privacy operating here (Mulder et al. 2008).

5. Be sensitive to possible sources of conflict, not only internally within the network but also outside of the network with important others.

Methods employed for initially enlisting stakeholders should make a distinction between direct and indirect recruitment. In the latter case, third parties are used to act as mediators. 'These methods, defined as 'networking' consist of asking potential users to designate other users to form a chain, hence mobilising the relational resources. Considering that it might be hard to engage end-users, especially often under-represented groups (elderly, women, migrants, etc.), this strategy poses a viable way to reach those groups.

6. Use both direct and indirect methods for recruiting.

Where possible, use a strategy of alignment—enlist stakeholders who are already engaged in everyday activities and agendas aligned with the objectives of the living lab. This alignment can be used both as a means of 'match-making' and accelerating 'buy-in' to what the living lab is attempting to achieve.

7. Use alignment to achieve match-making and accelerated buy-in.

Co-production activities have to define their own 'action space' by going beyond 'what is already out there' and so add value for stakeholders by setting the stage for new alliances and new sets of challenges and achievements. This illustrates the 'but for' principle for evaluating the effect of what is being done. What needs to be demonstrated here is that: 'But for the existence of the living lab, this outcome would not have been achieved'.

8. Ensure co-production creates a unique project space with outcomes beyond what might have happened in any case.

Setting up a clearly dedicated development process helps stakeholders—with diverse agendas—but with a readiness to form themselves into different alliances (so-called coalition of interest)—by providing clear governance structure within which to operate. This clarity will help them to working together to achieve their own and shared objectives. These arrangements about how relationships and decision-making with the living lab will be governed can have wider benefits. Agreements about the co-design of service scenarios can allow them to 'travel' between different alliances and activities in a smart city's other networks and so gain new meanings as they are interpreted and appropriated by new sets of actors. Establishing a narrative to support this type of transference has to start early on. Paying attention to governance of stakeholder engagement in the living lab should be seen as an attempt to systematise and make co-production accountable. Agreeing a vision and a plan for co-production with clear timescales and responsibilities is a helpful first step here.

9. Secure good governance structure and mechanism in the living lab from the beginning. As the living lab grows larger and more complex, the need for formalisation of its governance structure will become stronger and more evident.

5   Conclusion

This chapter has sought to present a critical review of the concept of stakeholder engagement and its implementation in living labs as a means of co-producing new and innovative smart city services. The experience rehearsed here indicates that setting up an effective living lab—capable of supporting meaningful co-production of services—is far from being a trivial task. Previous literature on living labs has tended to treat the process of stakeholder engagement as monolithic, without breaking it down into its constituent and sequential steps. It has also tended to overlook or take for granted the extensive skills and expertise needed to launch and then maintain successful co-production activities. In this chapter, we have drawn on the (admittedly limited) experience gained on the Peripheria project to begin to address these two missing ingredients essential for making stakeholder

engagement 'work'. We have provided a focussed and operational framework for the 'stakeholder engagement' construct and have presented experience about its meaning in the co-production of smart city services. By offering a critical review of Peripheria project's original aspirations and its actual performance in its five urban Arenas, we have tried to identify the importance of placing a special emphasis on the 'front end' of the engagement process as a necessary prerequisite of co-designing innovative FI services. We have sought to answer 'What is needed to make a Living lab really work?' by drawing up a set of working assumptions—our propositions—about key factors that are crucial for setting up and then running successful engagement of disparate stakeholder groups. These propositions—although tentatively expressed because of the slenderness of our evidence base—point both to a policy agenda and to working practices for co-production activities in smart cities.

Experience gained on the Peripheria project suggests that, in practice, a step approach to stakeholder engagement is necessary to co-produce innovative civic services. In turn, this suggests the need for a new strategic agenda for smart cities in Europe, one focused on ensuring effective engagement of citizens and other diverse stakeholder groups (representing communities of place, interest and practice) for creating the services they need to ensure them a better quality of life and a more attractive urban environment. Given the fast pace of innovation in smart cities, existing civic engagement strategies need to be rethought and restructured. If this is not done, European cities may lose out on effectively realising the opportunities for open innovation offered by living labs. Policy-makers, entrepreneurs and citizens alike all need to be able to cope with the demands that the living lab approach brings if they are going to be able to exploit its innovation potential for the smart city.

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