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Published in:
Innovation Journal

Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Hansen, A. V., & Fuglsang, L. (2020). Living Labs as an innovation tool for public value creation: Possibilities and pitfalls. *Innovation Journal*, *25*(3), 1-21. Article 4. https://www.innovation.cc/scholarly-style/2020_25_3_4_hansen-fuglsang_public-value.pdf

Living Labs as an Innovation Tool for Public Value Creation: Possibilities and Pitfalls

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ABSTRACT

The aim of the paper is to explore how living labs, as a specific tool of innovation in the public sector focusing on stakeholder and citizen involvement, can enable public value creation with a commitment to democracy. The paper is based on a thorough presentation of living lab literature and two case studies of living labs within Danish local government settings. The paper reveals that living labs within Danish local government are working with multiple notions of what living labs are, the role of citizens in co-creation activities, and how living labs are legitimized. Analyzed through the lens of public value theory and the strategic triangle, the article particularly discusses how living labs can contribute to creating democratic practices that strengthen public value. The paper shows that living labs can facilitate a collaborative and democratic approach to innovation in the public sector, and that there are pitfalls of living labs in creating a vision of citizen engagement rather than a reality of democratic practices of value creation.

***Key Words*:** living labs, public value creation, public innovation, democracy

Introduction

The shift in focus in public administration literature from New Public Management (NPM) to New Public Governance (NPG) (Osborne, 2006) implies a change in the way innovation in the public sector is understood and organized (Hartley, 2005; Sørensen, 2016), from a mainly intra-organizational focus to one on inter-organizational relationships. NPG describes innovation as a collaborative process where multiple and interdependent actors explore and develop solutions to shared challenges (Sørensen and Torfing, 2016: 154; Bryson et al., 2017). This has led to increased interest in innovation as a collaborative and distributed process, including new ways of conducting and managing co-creation between citizens, public administration, civil society, and the private sector. Some of these emerging forms of collaboration can be framed as local participatory governance initiatives; attempts at citizen engagement that tie into representative and participatory aspects of deliberative democracy (Hetting and Kugelberg, 2017; Young, 2000). In this way, the discussion of new innovation practices is linked to underlying perceptions of democracy. This article argues that living labs, based on elements of both representative and participatory democratic forms, are a tool of innovation that potentially trigger public value creation processes. As of November 4, 2019, the European Network of Living Labs (ENoLL) stated that living labs are: "user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings." Within a local government context, this translates into involving citizens and other stakeholders in coalitions for development and

delivery of public value, which is why living labs can potentially be seen as a tool of innovation based on democratic ideas of local participatory governance that are part of a public value creation framework (Hetting and Kugelberg, 2017).

This article thus examines how living labs, as a tool of innovation, can contribute to public value creation. Living labs are seen here as the independent variable and public value creation as the dependent variable. In line with Benington (2011, 2015), Bryson et al. (2017), and Hartley, Parker and Beashal (2019), we understand public value as a societal value created through contested democratic processes between relevant stakeholders seeking to deal with "wicked" public problems (Hartley, Parker and Beashal, 2019). In this research context, there is a call for developing research on public value creation suited to a multi-actor context that maintains a commitment to strengthening democracy (Bryson et al., 2017). Therefore, our research question is the following: can living labs, as a tool of innovation, be understood as a framework for public value creation?

In this paper, we build on Moore's strategic triangle (see Benington and Moore, 2011), where public value arises in the interaction of three mutually dependent processes: 1) defining public value (clarifying what the strategic goal is); 2) creating the "authorizing environment" (creating a coalition of stakeholders from the public, private and third sectors who support the strategic goal); and 3) building operational capacity (ensuring there is capacity at the operational level to implement the goal).

However, Moore's strategic triangle was meant to describe what public managers should do, so the model is not well suited to describing more complex processes of public innovation that involve multiple stakeholders (Bryson et al., 2017). There have been various attempts to describe public value creation processes as more complex, multi-actor, collective and democratic processes (Bryson et al., 2017; Hartley, Parker and Beashal, 2019). Yet to the authors' best knowledge, there are no studies on how living lab processes could be seen as contributing to public value creation in the above-mentioned sense. The specific contribution of this paper, therefore, is to initiate a discussion of how living labs, as an innovation tool in a multi-actor context, could potentially be seen as a way to organize public value creation as collective and democratic processes. The paper contributes to the public value creation literature by proposing that living labs can be a path to public value creation. It also contributes to the living lab body of literature by linking the living lab construct to the literature on public value creation and democracy, thereby clarifying the role of the living lab in a public context.

The paper is structured as follows. First, living labs as an innovation tool are positioned in the wider field of public sector innovation. Second, a short introduction to the concept of public value creation and its link to democracy theory is given. Third, a thorough presentation of literature on living labs as a phenomenon is presented. Fourth, insights from two smaller case studies of living lab practices from local government settings in the context of Danish healthcare are analyzed, applying the strategic triangle. Finally, the potentials and pitfalls of living labs as platforms enabling public value creation and, by extension, democratic ethos are discussed and future avenues of research outlined.

Living Labs as a Tool for Public Sector Innovation

The concept of innovation has been used in research to study change processes in the private, public, and civil sectors. Innovation is largely described as the realization of a new idea in practice, and research has particularly focused on what innovation is, how it takes place, how it can be explained, and what the consequences of innovation are (Fagerberg, Fosaas and Sapprasert, 2012). Innovation is not the same as a continuous process of improvement in an organization (Osborne and Brown, 2011). Innovations should be understood as "step changes" (Hartley, 2006; see also Sundbo, 1997; Torfing. 2019) that need to be perceived as significantly new by the involved relevant stakeholders in an organization to count as innovations. Furthermore, innovation may or may not lead to perceived improvements, thus innovation is not *per se* improvement (Hartley, 2006). The literature generally describes the innovation process as interactive, involving many types of actors in exchanges of ideas, drawing on different types of knowledge, both scientific and practical (Jensen et al., 2007; Fuglsang, 2008). Thus, innovation can emerge as a strict scientific idea in a structured process, as pragmatic bricolage-like acts of problem-solving (Witell et al., 2017; Fuglsang and Sørensen, 2011), or as combinations of the two.

Innovation in the public sector has lately become promoted in research and practice as an important way to address public sector development. The literature describes how innovation is embedded in three governance structures: traditional public administration (large-scale, universal innovation, developed by policy-makers); new public management (innovation of organizational form); and networked governance (bottom-up and top-down innovation of public policy and public services by all actors) (Hartley, 2005). In the latter case, the literature especially discusses various processes of co-creating, co-constructing, co-innovating, co-producing, and co-designing public services in the light of new networked and collaborative governance arrangements. This paper is situated in the latter tradition, addressing the need to collect knowledge about how such institutional arrangements of innovation can be organized and what the implications for political and democratic governance are. The argument is that living labs can be viewed as a special tool that produces collaborative innovation across citizens, policy-makers, and other stakeholders, while also creating an authorizing environment (Benington and Moore, 2011) and support for public value creation. Living labs are thus innovations in themselves, but they are also arenas and tools for the development of innovations within a political and democratic structure of public value creation.

The Concept of Public Value Creation

The public value approach within public administration theory has developed new ways of thinking about government activity, policy-making, and service delivery (O'Flynn, 2007). Starting with Moore's argument that the role of public managers is not only to serve public administration but also manage the creation of public value, he opened up the research field by proposing the public value strategic triangle as a tool and model to encourage managers to manage upwards to an authorizing environment (a coalition of relevant actors supporting the strategic goals for public value creation), manage outwards to stakeholders to define the strategic goals, and manage downwards to ensure operational capability (Benington and Moore, 2011;

Bryson et al., 2017). Moore (1995) had, from the outset, the public manager and management issues as key concerns. More recently a multi-actor approach to the strategic triangle has emerged, stating a need for exploring much more complex interactions between actors, arenas, and practices as a basis for public value creation with a commitment to strengthening democracy (Bryson et al., 2017). However, it could still be argued that the practical managerial approach to public value creation illustrated a profound change in perspective, e.g., from the management of effectiveness and efficiency, as in new public management, to the management of value as a collective activity, changing the focus of public management from results to relationships (O'Flynn, 2007).

In the context of this paper, the public value approach also provides a new way to think about innovation and what it does in the public sector, that is, innovation as an activity, practice, and platform for creating and negotiating public value with a commitment to democratic principles.

Benington argues that public value should be understood and analyzed through the notion of the public sphere as a democratic space where citizens address collective concerns and individual liberties are protected (Benington, 2015: 31). This understanding of the public sphere leads to a broadened perception of public value, encompassing both *what is the public value* and *what adds value to the public sphere*. Thus, public value should be understood in terms of what is currently valued by users, citizens and communities and of what will be the public interest from a long term perspective (Benington, 2015: 31).

Benington emphasizes *agonistic* democratic practices as a means for public value creation: "the concept of 'public value' offers a framework for thinking about the end goals of such kinds of agonistic democracy; and the debate about 'public values' helps to identify the virtues and capabilities required for this democratic praxis" (Benington, 2015: 31). In this way, what is of value to the public sphere becomes an outcome of certain democratic practices. Since Benington is mainly concerned with deliberative democracy, public value is dialectically constructed between competing values and interests expressed in debates; this partly stands on the shoulders of Habermas' notion of deliberative democracy and Mouffe's application of the term agonistic pluralism (Benington, 2015). According to this view, deliberative democracy refers to political opinion and will formation through dialogue (Habermas, 1996: 359–363), and in this way, the process of *forming* political opinion through deliberation becomes key. To exemplify, Young (2000) describes deliberative democracy, relative to civil society, as a space for citizens to meet, express their opinions, and engage in activities and issues that are close to their daily lives (Young, 2000).

This contrasts with the perception of democracy as aggregative, i.e., as a certain governance mechanism that aggregates preferences and hence underscores the act of aggregating voices as central for democratic practice (Habermas, 1996; Young, 2000). As such, when discussing democratic practices from a public value perspective, deliberative aspects of democracy are emphasized while aggregative aspects are more likely to be downplayed. Besides this distinction between aggregative and deliberative understandings of democracy, it is also possible to distinguish between representative and participatory democracy; deliberative democracy can be part of both representative and participatory forms of democracy. Hence, the deliberative model is enacted through political discussion when electing politicians, and as a

more local form of democracy participation enacted in direct decision-making processes (Teorell, 2006).

There is a need for more empirical studies of how public value is created by multiple actors (Fukumoto and Bozeman, 201; Hartley, Parker and Beashal, 2019; Hartley et al., 2017). To exemplify, some theorists have linked the understanding of public value to co-production and co-creation. Alford (2016) argues that more systematic studies on the roles of client and citizen in co-production need to be undertaken. Sancino, Rees and Schindele (2019), based on Benington's understanding, argue for co-creation processes of cross-sectorial collaboration, as a way to achieve public value. Accordingly, they argue for a more profound discussion of public value in the context of the public sphere, as ways for the public sector to address "wicked problems" (Sancino, Rees and Schindele, 2019: 72). Others, also building upon Benington's notion of public value as a contested practice, argue that managing and leading processes of public value creation are key factors (Hartley, Parker and Beashal, 2019).

Answering these calls for more empirical studies of cross-sectorial collaboration on public value creation, this paper explores how living labs as a tool of innovation can be a framework for public value creation seen through the lens of the strategic triangle. Benington's definition of public value is applied to better understand how living labs, as a current public sector innovation phenomenon, contribute to public value creation. Moreover, the public value perspective, with its democratic underpinnings, is integrated into the final discussion of local participatory governance on which living labs are currently based and which define the democratic forms they may support in the future.

To explore living lab activities in the context of public value creation, Benington and Moore's (2011) definition of the strategic triangle is applied. Benington and Moore define the strategic triangle as a framework for aligning three interdependent processes of public value creation – corresponding to the above processes of managing upward, managing outward and manage downwards: 1) creating an authorizing environment to support public value creation ("manage upwards"), 2) clarifying strategic goals and public value outcomes by involving stakeholders ("manage outwards"), 3) building operational capacity to achieve the desired public value outcomes ("manage downwards"). This framework is used in the present article to structure the analysis of two cases to see whether and how such elements are salient in the living lab practices. Thus the article look for 1) living lab perceptions of the authorizing environment, i.e. the coalitions of actors that are implied as necessary to support action; 2) actor roles for sustaining operational capacity for public value creation; and 3) defining the strategic goals of public value creation, i.e. how clarifying and specifying the overall public goals and outcomes are practiced.

The Living Lab Phenomenon

The notion of living labs emerged in the context of information and communication technology (Ballon, Pierson, and Delaere, 2005; Eriksson, Niitamo and Kulkki, 2005; Følstad, 2008), but has later been extended to the area of services and public services (Gascó, 2017; Schuurman and Tõnurist, 2016). Living labs are seen as tools for involving stakeholders in

inclusive and participatory processes of open innovation. Gascó (2017) defines living labs as "intermediaries of public open innovation" and as "settings or environments for open innovation, which offer a collaborative platform for research, development, and experimentation in real-life contexts, based on specific methodologies and tools, and implemented through specific innovation projects and community-building activities" (p. 91). Living labs are thus framed as tools for "managing outwards" by inviting stakeholders into innovation processes and "managing downwards" by building operational capacities for experimentation and innovation.

The literature describes living labs as an infrastructure or methodology for involving interdependent stakeholders, including users, in innovation. Citizens/users can be engaged in the whole innovation process (Björgvinsson, Ehn and Hilgrenn, 2012). Perhaps more typically, they are invited into the innovation process at different stages of innovation, for example, in the idea-generation stage or in later stages as evaluators of a given technology/social initiative that has already been invented and needs to be refined (Edwards-Schachter, Matti and Alcantara, 2012; Keijzer-Broers et al., 2015). Living labs convene and facilitate different actors around innovation activities and projects. In some cases, the main aim of living labs is as platforms for democratic engagement, where the notion of innovation is oriented toward social innovation (Edwards-Schachter, Matti and Alcantara, 2012).

Nevertheless, how living labs include the various elements of the strategic triangle is not clear from the literature. First it is unclear how defining strategic goals is described in the literature and practiced in the various cases studied in the literature. Even when the citizen and/or user has some degree of decision-making power, they are seldom part of the very early innovation stages where challenges are identified. Some authors see a continuous democratic contestation and discussion among actors as the reason behind living labs. As such, the objective of living lab activities is as spaces for democratic engagement, making the main beneficiaries the citizens themselves. Conversely, urban studies' authors see living labs as the means to address grand challenges such as sustainability and wider societal challenges, suggesting that the main beneficiary is society at large. A core element in the living lab definition is co-creation. However, what constitutes co-creation, that is, who are part of the "co" and what is in fact created, can differ from case to case. At one end is a collective view, emphasizing democratic ideals based on creating room for discussion and debates among various groups of people, thus ensuring that a polyphony of voices is heard (Björgvinsson, Ehn and Hilgrenn, 2012; Cardullo, Kitchin and Di Feliciantonio, 2018). One of the most inclusive definitions of the concept is put forward by Björgvinsson, Ehn and Hilgrenn (2012: 130): "This acknowledges co-creation as a collective interweaving of people, object and processes. At the other end is a more individualistic view, emphasizing the subjective needs of the actors involved (Äyvaäri and Jyrämä, 2017; Edwards-Schachter, Matti and Alcantara, 2012). As such, the user/citizen is approached as co-creator among other actors also invited into the innovation process. Dell'Era and Landoni (2014) refer to these different approaches as either an expert or participatory mindset. In the former, users are subjects or *reactive* informants; in the latter, users are partners or *active* co-creators (Dell'Era and Landoni, 2014: 148).

Second how living labs potentially sustain an authorizing environment ("manage upwards") to support their public value creation processes appears ambiguous. The short-lived aspects of living labs, regarding constrained funding, political support, and lack of proper business models is often emphasized (Nesti, 2017: 279; Pino et al., 2014: 259). This is backed up

by Tõnurist, Kattel and Lember (2017), who also identify a high mortality rate, presumably due to the loss of political legitimacy and conflicting organizational structures. According to Tõnurist, Kattel and Lember (2017), innovation labs are fluid and semi-autonomous, seen as answers to complex issues, such as economic crises and democratic challenges (Tõnurist, et al., 2017: 1473). Therefore, innovation labs are catalysts for legitimizing change within the public sector, with their strengths related to their potential as change agents in creating new organizational forms, while their weaknesses are related to resistance and lack of sustainable organization. Despite these critical concerns, and the conceptual blurredness relative to co-creation citizen roles, few authors profoundly question the legitimacy of living labs as a new and fruitful approach to public sector innovation.

To summarize, the main points in the literature are as follows: 1) living labs are perceived as an open innovation eco-system and/or as structured approaches to open innovation; 2*)* the characteristics of the living lab, that is, a real-life setting and user co-creation, include multiple definitions, but it is conceptually unclear how co-creation and user participation is in fact organized; 3) users/citizens are seldom engaged in identifying challenges and they do not appear to have strong decision-making power; 4) living labs are either legitimatized as platforms for democratic engagement or as inclusive innovation processes; and 5) few studies problematize the raison d´être of living labs, even though there is little documentation of their outcome and impact. Hence, since it is unclear how living labs intend to add to the public sphere and public value creation, it is relevant to further investigate how different approaches to living labs affect public value creation in the context of representative and participatory dimensions of deliberative democracy.

Methods

To empirically explore the paper's research question and the main aspects of living labs revealed in the literature, a holistic multiple case study (Yin, 2014), encompassing two organizations, has been conducted. The purpose is to explore how the living lab can be a framework for public value creation in a multi-actor context in two slightly different settings, one with a private and the other with a public driver of living labs. In addition, we assess how these settings maintain a commitment to strengthening democracy. The public sector in Denmark is depicted by a move toward new public governance, with an explicit focus on co-creation as both a new mindset and practice (Agger and Torzen, 2015). Moreover, the Danish public sector has been at the forefront of citizen and user involvement in developing public services (Carstensen and Bason, 2012). Thus, in a Danish context, the term living lab and the focus on user and citizen involvement are widely known and familiar to public sector actors.

Both cases are positioned within policy field of the Danish health care sector, more specifically: elderly care and general health care relative to the Danish hospitals. The cases have been selected as critical cases (Flyvbjerg, 2006). Both organizations strategically apply the term living lab and focus on developing public services and public value by creating an authorizing environment for innovation, aiming at changing operational capacity and defining strategic goals for public value creation; moreover, they disseminate practices and insights based on a high degree of interest from both national and international public actors. As such, the case

organizations are approached as examples of well-known living lab activities for public value creation; hence, the argument for selection is that the findings of these cases will most likely reveal basic mechanisms in the study context (Flyvbjerg, 2006). The two cases are also suitable for widening the study of the living labs phenomenon because they demonstrate slightly different living lab practices while still targeting the same overall domain of developing future healthcare.

Research Design and Data Collection Method

The research design is based on a qualitative case study strategy. Case studies are particularly relevant for asking *how* and *why* questions regarding a contemporary phenomenon and, as such, enable the collection of rich data by going deep rather than broad (Thomas, 2011; Yin, 2014). Hence, the aim has been to reach more in-depth understanding of how living labs are played out in specific local contexts and how this illustrates and relates to the overall theoretical dimensions identified in living lab literature and public value research.

Table 1: Overview of Data Material

Type of data	**Case Organization 1**	**Case Organization 2**
Interviews	Two semi-structured interviews with municipal living lab consultants. One semi-structured interview with municipal living lab manager. One semi-structured interview with collaborator from the private sector. One semi-structured with collaborator from a university.	One semi-structured interview with the CEO. One semi-structured interview with the Design and Method Director from the living lab organization. One semi-structured interview with Senior Project Leader from the living lab organization. One semi-structured interview with a Chief Consultant at a university hospital collaborating with the living lab organization.
Documents	Official minutes on living labs within the framework of the municipality. An internal project report on a product development process. The private collaborators' report on the product development process.	A written description of the innovation methodology of the living lab provided by the living lab organization. A written description of the specific living lab project focused on a hospital provided by the living lab organization. Notes from a kick-off meeting.

The case studies comprise data collected over a four-month period in spring 2019. The main data collection methods were interviews and document analysis. More specifically, the interviews focused on the key actors and their understandings of the aims and processes of living labs. Interviewees were selected from across the sectors engaged in the collaboration, that is, employees and managers from the private and public sectors and from academia, chosen based on their knowledge of and experience with living lab activities. Due to the vulnerable context of the elderly living in care homes in Case 1 and the time limitations in Case 2, no interviews with citizens have been conducted. Moreover, the research has been supplemented with documentary materials, both as background resources and as illustrations of how living lab collaboration and

activities are discursively constructed (Justesen and Mik-Meyer, 2012: 126). Table 1 presents an overview of the conducted research.

All interviews were audio-recorded and partly transcribed; together with the document study, they were subject to a thematic analysis (Silverman, 2011).

Living Lab Insights

In the following section, the main insights from the two case studies are presented. The analysis is structured around the three elements of the strategic triangle of public value creation as it was outlined in the section on The Concept of Public Value Creation: 1) living lab perceptions of the authorizing environment; 2) actor roles in creating operational capacity; and 3) defining the strategic goals of public value creation. To set the stage for the analysis, a short history of each living lab initiative is given.

Case Organization 1

This case study concerns an internal innovation and quality unit in a municipality, which uses the term living lab for its innovation activities. The unit was established in 2016 based on a desire to strengthen innovation activities and capabilities within elderly care. The unit has two main focal areas: quality assurance and innovation. The innovation part of the unit is the study's primary focus. The innovation team comprises four consultants and the main activities of the unit are to: develop an innovative mindset across the whole organization; disseminate and share knowledge externally; monitor projects as project initiator, project lead, or partner; and manage a yearly innovation fund. Public (based within the municipality), private, and civil actors can apply for project money via the fund if the projects are finalized within one year. Relative to living lab activities, it is not clear when and which projects are framed in this way, but most projects focus on developing technological solutions to elderly care and are organized as cross-sectorial, collaborative innovation projects inspired by the concept of living labs.

Case Organization 2

This case concerns living lab activities driven by a private consultancy company (hence utilizer-driven) in the context of healthcare at the intersection between healthcare organizations, municipalities, and citizens. The company was established in 2007 after municipal reform in Denmark, when the founders saw the need for a new consultancy house to advise on innovation in the context of public-private collaboration and digital innovation. The idea emerged from meetings with a director of a Danish municipality and the CEO of a municipal welfare technology company. In 2015, the consultancy company created a city living lab, based on the establishment of three street laboratories, in a city of about 25,000 inhabitants. The idea emerged from relationships with the Director of the municipality and the Clinical Director at the local hospital, as the Clinical Director had a vision for a larger living lab, which would transform healthcare services provided for citizens. A strong relationship between the Clinical Director and the consultancy company developed, but it took some years to convince the municipality about the idea; in 2017, the living lab was finally established. The living lab is convened by a secretariat located in the consultancy company, but comprises four partners: the hospital, the consultancy company, the municipality, and the university.

Living Lab Perceptions of the Authorizing Environment

In Case 1, the informants from the municipality perceive the term "living lab" in a highly positive way. The history of applying this specific notion dates back to 2014, when the municipality created a nursing home *of the future*. The phrase originally referred to a test setting, and a consultant recounts how, from the beginning, they were very keen to use the term since they were working together with the Copenhagen Living Lab and found the label to be relevant to their own approach and activities. Today the term has a broader application since, from the municipality's perspective, it is a platform that offers external actors in particular an entry point to collaborate with the public sector and to access target groups such as the elderly that they could not otherwise have approached. As a consultant stated:

> *Living lab is not a locality, it is not a specific place, it is not a laboratory – it is a way of doing things, it is a method. And as methodological approach you can attain a certain form of width and depth because you get a larger degree of flexibility to bring in many different project partners.*

As such the value to the municipality is that the services and products from the private sector are refined and are better supported and suited to the context of either the elderly or employees.

From the private collaborator's perspective, the term living lab refers mainly to a test environment. The notion of living lab was new to the company but they have integrated the ideas and philosophy of user-driven processes and the collaboration has opened up a new way to develop, present, and discuss their own products. In opposition to this company-centric view, the informant from academia stresses that the living lab refers to a contextual and related approach to both the challenges and the user groups involved. This can be in relation to a test-setting and to ethnographic studies, and in both cases the notion of the living lab is strongly linked to understandings and practices of user-driven innovation, while at the same time forming a coalition of various stakeholders and involving them in innovation:

> *Call it living lab or whatever – the main thing is that we involve health professionals, users, companies, researchers and public actors. Since there is no clear definition of living lab, I can easily say that I am doing living labs all the time or I can simply say I am doing user-driven innovation*.

In Case 2, the notion of living lab was also used early on, but initially understood mostly as a *showroom* for welfare technology. The company consequently ran a living lab apartment (a semi-realistic home to test health technology) for the municipality from 2009. However, the living lab took a new meaning as it also became discussed more in a Danish context, and it is now seen as a problem-driven method of innovation, involving relevant stakeholders in defining and supporting a problem-context for innovation. Within each problem-context, a series of test arenas are created that together form a test environment. In this approach, living labs are seen as strategy-driven and purpose-oriented, and are ideally integrated with operations to create impact. The budget is low, but the consultancy company sees the living lab as important to the proof of concept. The living lab activities are centred around a core lab and a trusted user lab; the core lab is where strategies are formulated among the main stakeholders, and the tested user lab is where

citizens test solutions, thus a broad coalition of stakeholders. Related to the living lab are a number of university and hospital projects that use it to test ideas and integrate existing and new resources.

In both cases, the term living lab is to some extent negotiated among actors, with each actor approaching the concept through the frame of their own perspective and interests. It is also evident that the application and understanding of the term has evolved over time, and in pace with increased political awareness, moving from a narrow understanding of situated testing to an inclusive understanding of an open innovation methodology involving supporting coalitions of actors that, in some sense, authorize the innovation process. Moreover, it is revealed that the living lab both refers to and enables a certain *discourse* and a means of *organizing* – meaning the strength of the living lab concept lies in signifying openness to a variety of interpretations and stakeholders, without influencing the shared experience among the actors involved; the collaboration is highly meaningful by creating a problem-context supported by multiple actors.

Actor Roles Creating Operational Capacity through Innovation

In Case 1, all living lab initiatives are framed as *projects* based on a structured approach to innovation with different phases and a set timeline meant to impact the operational capacity of the involved organizations. The main actors addressed are users, specifically employees and citizens. The innovation unit is the primary lead regarding the research design, encompassing traditional user studies, e.g., citizen interviews in their private homes or at care centers, and public servant (employee) interviews and feedback, whereas the experimental aspects of living labs are enacted as test set-ups in homes and care centers. In this way, user/citizen and employee insights are iteratively integrated in different innovation stages, however, both groups are approached as experts, that is, as experts in their own working context and/or life. It is crucial to the municipality to detect both what the challenges of users/citizens are and what they can accomplish in the municipality at the operational level. Nevertheless, most ideas and initiatives come from either within the municipality or from the private sector, and not from citizens themselves. Moreover, the citizens and users are not part of decision-making processes in the final stages of innovation or in identifying the overall challenges related to elderly care in the future. In this case, there is a strong focus on how innovations can match operational capacity within the municipality.

Citizens are also addressed in Case 2, and for the street laboratories have been selected as representative of views on healthcare among the municipality's population in order to set priorities for changing operations in the municipality. First, three different streets were selected that appear to represent the population well, i.e., representing different family types and income and age groups. A letter was written and an announcement made in the local newspaper to invite people to information meetings. At these, citizens were invited to participate in the living lab, with a light dinner served afterwards as a kind of community event. From the street laboratories, 13 insights and four health visions have emerged, which citizens consider to be important in meeting the needs of the healthcare system; this has provided a strategic context for all living lab activities. Some of the insights and visions developed by the street laboratories indicate a new role for patients who, rather than being admitted to the hospital, remain in their own home. Another way in which citizens are involved is in trusted user-labs, in which ideas for innovations are tested in the street laboratories. However, Case 2 strongly stresses changing operational capacity of the host organizations by involving professionals in the innovation process. Ideas for

innovation do not stem from the citizens themselves but, rather, from projects established in the hospital or the university that form part of the living lab environment. However, in this case, there has also been a focus on ensuring the operational capacity of the citizens to carry out new roles, by testing solutions in a real-life context.

Regarding actor roles, the two cases slightly differ: in Case 1, both employees and citizens are mainly viewed as reactive informants, whereas in Case 2, citizens have actually contributed to identifying problems in the very early innovation stages, as the street laboratory approach implies that citizens can potentially raise their concerns and identify challenges in a more formative way. In Case 1, the municipality facilitates already agreed-upon projects based on a structured approach to innovation, seeking to develop the necessary operational capacities in the municipality. In Case 2, the street laboratories and cross-sectorial collaboration allows a more experimental approach to developing new types of capacity that also involves capacity building among citizens. Despite these inclusive processes with the collaboration of different stakeholders, it does not seem that citizens are part of the final decision-making process of what is actually going to be operationalized in either of the cases. Therefore, the notions of either reactive informants or active co-creators are not solely related to the whole innovation process but rather to stages *within* the process, so neither case displays a radical approach to co-creation based on a collective view of democratic ideals.

Defining the Strategic Goals of Public Value Creation

In Case 1, the private and public actors perceive the living lab as a legitimate tool of innovation on its own terms, despite differing understandings of what living labs contribute and to whom, while the actor from academia more critically reflects on what the term brings to the table. In this way, the concept of living lab is partly seen as a political and legitimizing term regarding funding, and not as a new way of *doing* innovation. The activities carried out within the living lab context are mainly addressing public value, that is, what the public (in this case the elderly) values. As such, they are primarily based on an individual focus, but there are still collective aspects at play to the extent that the new methods, processes, and products developed are seen as the means to define future welfare within the domain of elderly care. This is mirrored in the triple bottom-line of value creation that is part of all projects carried out: increased quality for the citizens, better work environment for employees, and value creation for the organization. Nevertheless, rather than aiming to debate how elderly life might be lived and developed for the common good, both the individual and the less-emphasized collective focus are based on a very strong discourse that the best life for the elderly is to be self-sufficient and to stay in their own private homes for as long as possible.

In contrast, the main rationale for the living lab in Case 2 is more explicitly to define and create value for citizens and society in the long term. Due to demographic changes, better and more expensive medical treatments, more informed citizens, and their demand for higher service quality, the consortium agrees there is a need to profoundly transform the way healthcare is delivered. The value aspects involved are, therefore, long-term public goods, i.e., the effective functioning of the healthcare system of the welfare state. Further, mobilizing the community and aspects of community care is a value created in the project, since the living lab environment is understood as enabling various stakeholders, including citizens, to make their voices heard, adding to the overall strategy. In addition, researchers are mobilized to devise solutions aligned with the strategy and the citizens concerned, before solutions are then tested in a real-life

environment to get feedback from citizens. The living lab, by a facilitated process, thereby provides a method and an arena for public value creation. In this way, the consultancy company uses leadership and facilitation to move people's opinions and emotions into a convened public sphere.

Across the two cases, only the contours of living labs as potential democratic platforms for public value creation are apparent. In Case 1, the citizens are recruited in living lab activities as individuals representing a specific group of citizens, namely the elderly, and since the focus is on individual needs, the elderly are not partaking in a wider discussion of what a good elderly life is or how society can be organized in the future to meet collective challenges. In Case 2, the living lab approach is used to convene a process assembling different voices around a common cause within a public space. Hence, being embedded in the street laboratory and in the municipal context of important stakeholders, it stimulates debates about healthcare services and the place of community care in the general healthcare system. Despite these differing levels of participation concerning actor roles, neither of the cases are explicitly concerned with notions of democracy but are, instead, approaching the notion of the living lab as a method in its own right. Nevertheless, both cases reveal that living labs can be understood as catalysts for legitimizing change in the public sector and they appear to be sustainable in the domain of public sector innovation based on local citizen engagement.

Table 2: Summary of Case Findings

Key concepts	**Case Organization 1**	**Case Organization 2**
Living lab as a tool of innovation	Innovation as a structured process to develop innovative capabilities based on a citizen/user-centric approach.	Innovation as a structured process committed to including insights from citizens and meant to produce radical change.
Living lab perceptions of the authorizing environment	Living lab refers to an innovation methodology, involving a coalition of stakeholders into the innovation process.	The term living labs refers to a problem-driven method of innovation directed toward a specific problem context agreed upon by a coalition of stakeholders.
Actor roles creating operational capacity through innovation.	The municipality facilitates already agreed-upon projects based on a structured approach to innovation, seeking to develop the necessary operational capacities in the municipality among employees – making users and citizens mainly reactive informants.	The living lab allows an experimental and testing approach to developing new types of capacity that involves capacity building among citizens as well as employees. Citizens participate in experimental projects enabling them to be both reactive and active co-creators of ideas for innovations.
Defining the strategic goals of public value creation	As matchmaker between and translator of public and private sector logic, living labs mainly address public value in terms of what the public (here the elderly) values; ideas of representative democracy with participatory elements.	As transformer of healthcare to ensure future sustainability by creating community care, living labs address public value in terms of adding value to the public sphere, based on ideas of representative democracy with participatory elements.

Discussion: What do Living Labs Contribute to Public Value?

Both the emerging and evolving literature base on living labs and the two case studies reinforce the concept of the living lab as a contemporary tool of innovation, which addresses the need for public sector innovation based on inclusive collaborative processes. They also demonstrate that living labs are an enabler of collaborative public value creation by creating an *authorizing environment* for this, building *operational capacity* through co-creation and innovation and *defining public value*. Even though the term living lab is widespread, both as an analytical and empirical concept, it is still highly contested and negotiated among partners involved in collaboration of this kind and among academics theorizing the concept. Despite differing understandings and applications, the notion of the living lab is primarily embraced and presented as a specific tool of citizen-centric innovation – whether as a test bed, an innovation mediator, or as innovation methodology. The study also illustrates that living labs are intermediary practices of innovation that bring actors together around an innovation task. Another key aspect is the way living lab activities are organized and managed. In the two case studies, the living lab initiated by the public sector is less inclusive of citizens in the pre-phase and in the decision-making phase, whereas the living lab initiated by the private sector is based on a more far-reaching process where citizens are part of identifying challenges and where decision-making power is distributed among consortium partners. As such, the case analysis supports the points from the literature that the inclusive aspects of living labs should be seen as ranging from appropriating innovation in a user/citizen context to outright co-creation and processes of democratizing innovation. Hence, a potential pitfall of living labs, as a possible way of implementing public sector innovation at a local governance level, is that the intended active role of citizens becomes a potential blind spot; the outspoken focus and legitimacy of living labs is mainly related to citizens and users being directly involved in innovation activities with civil servants, but this might obscure the fact that that they are only indirectly part of addressing policy issues and political agendas.

Applying the lens of public value theory, the scope of the two cases differ: the public sector living lab is mainly targeting public value creation in the sense of what the elderly might value in the short term, whereas the private-sector-initiated living lab is more focused on what adds longer term value to the public sphere for future generations. The latter taps more into the notion of value creation in relation to public sphere development and contested democratic practice. As such, it becomes clear that ownership and management practices of such co-creation practices influence public value creation. This is in line with Benington and Moore's (2011) argument that public managers, leading public value creation practices, should be clear on what is the value added. Despite the exposed variations in actor roles and the focus on individual needs versus collective concerns, it can be argued that as long as citizens are not part of decision-making, living labs as arenas for deliberative democracy are mainly conducted as representative democracy with participatory elements, and less as participatory or agonistic democracy.

Therefore, it is expedient to include a discussion of which forms of democracy are at play in the context of living labs, and how this interacts with public value creation. Whereas Hertting and Kugelberg (2017) seem to perceive representative and deliberative democracy as two opposing democratic practices, the case studies more strongly support understanding deliberative democracy as comprising both representative and participatory aspects. Thus, there seems to be

further potential for living labs as new institutional forms of public value creation more profoundly based on deliberative democratic ideals of participation; where citizens are also part of identifying problems and become engaged in discussions of issues such as what good healthcare and elderly care should entail for both existing and future generations. This is in line with living lab research that sees them as a context of democratization (Björgvinsson, Ehn and Hilgrenn, 2012); Benington uses Chantal Mouffe's (2000) agonistic approach as a point of reference, in which many voices are engaged and empowered in a struggle for hegemony within a public space (Benington, 2015). This point is strongly linked to the notion of citizenship, which is perceived to require a certain form of citizen virtues, or what is referred to as democratic ethos (Forst, 2001). In line with Benington's (2015) approach to public value as a theoretical framework, the debate about public values and the urge to find common solutions also makes it possible to identify what is required to engage in these sorts of agonistic democracy. Therefore, the public value creation approach provides a set of perspectives and tools for thinking about innovation activities in living labs with normative implications. Living labs provide spheres for interaction and innovation across multiple stakeholders, with potential to increase democratic commitment and commitment to co-creation with citizens.

In summary, living labs, as tools of innovation, are *possible* platforms for collaborative public value creation, i.e., for defining public value, building an authorizing environment, and co-creating operational capacity. As such, living labs might also address the challenge of democratic deficit of innovation by bridging representative and participatory notions of deliberative democracy, ensuring that decisions are not only made in a network of authorities but also through more direct democratic channels at a local level.

Conclusion and Future Research Avenues

Returning to the research question: Can living labs, as a tool of innovation, be understood as a framework for public value creation? Living labs have potential both as practical platforms and conceptual frameworks for creation of public value. Based on a thorough analysis of living lab literature and two case studies from the Danish healthcare sector, this paper thus makes two main contributions. It contributes to the literature on public value creation by suggesting that living labs are an enabler of public value creation that can potentially maintain a commitment to strengthening democracy. This responds to a recent call in the literature for research on how the theory of public value creation and the strategic triangle (defining public value, creating the authorizing environment, and building operational capacity) can be developed and adapted to a multi-actor context while maintaining commitment to strengthening democracy (Bryson et al., 2017). The paper also links the living lab construct to the public value creation literature. This answers a call for further research to clarify how living labs can contribute to public collaborative innovation (Fuglsang and Hansen, 2019) and to clarify the roles of living labs, i.e., their potential role for public value creation and democratic value. Living labs offer new methods for citizen engagement in local government contexts. The empirical cases illustrate that despite a shared positive approach to framing collaborative innovation in a local government context as living labs, the aspects of public value and associated democratic engagement are not explicitly addressed and are solely advanced by a vision of citizen engagement. This study suggests that there is untapped potential for living labs as platforms for deliberative democratic practices,

which ensure an ongoing debate and dialogue among diverse actors about future welfare services. This is due to the way living labs or living lab activities are organized as inclusive processes and to the current high degree of legitimacy attached to applying such an approach to public sector innovation.

To develop this potential, there thus seems to be a need for a refined framework to better understand, explain, and evaluate the role of living labs in public innovation processes based on citizen involvement. The following future research avenues could be further explored and discussed: 1) how living lab activities can be integrated into public services and policy-making; 2) how living lab activities can be institutionalized and managed while still evolving dynamically in relation to relevant policy issues; 3) how the contribution of living labs to public value creation can be better conceptualized (including the role of the citizen and the user); and 4) how the impact of living lab activities on public value creation can be evaluated and according to which criteria. Hopefully such studies can be undertaken and add to living lab research and practice in the broader context of local government and democratic engagement.

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Acknowledgements:

We thank the two anonymous reviewers and the editors for useful comments

Disclaimer:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770356. This publication reflects the views only of the author, and the Agency cannot be held responsible for any use, which may be made of the information contained therein.

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