The representing professional, online professional or participating professional?

How public professionals identify their roles and tasks in case of living labs

Jill van der Bijl - Master Public Management and Leadership - February 2021

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Universiteit Leiden

Master thesis submitted to the Faculty of Governance and Global Affairs

For the fulfilment of the Master programme Public Management and Leadership

February 2021

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Preface

Before you lies the thesis ‘The representing professional, online professional or participating professional? How public professionals identify their roles and tasks in case of living labs’. The research aimed to distinguish perspectives of public professionals on their roles and tasks in case of living labs. It has been written to fulfil the graduation requirements of the Master Programme Public Management and Leadership at Leiden University. The research was conducted and written from September 2020 to February 2021.

The circumstances regarding the pandemic and the following measurements affected the writing process. It challenged me to be creative with data collection, but also created a long period of time where I could focus solely on the research due to the absence of other events or distractions. It was hard to only have online meetings and not being able to get inspired by your fellow students or teachers. However, my tutor Dr. Carola van Eijk motivated me by stimulating me to use a, for me back then an unknown, research method and securing me that I was capable of successfully conducting it. She was supportive and understanding when I needed it and I am very thankful for that.

The thesis is not only the final part of my Master programme, but also represents the end of my time as a student. I’m proud of all the choices I made during this time; studying at the Utrecht University School of Governance, learning Russian and travelling with the Transsiberian Express, doing an internship at a consultancy firm and finishing my Master at the University of Leiden. The same university where my mother did her final research being pregnant with me. She signed the walls of ‘‘t Zweetkamertje’ with me in her arms as a baby. Hopefully, I will sign those walls very soon. Then, it is a closed circle and a perfect end of my time as a student.

Enjoy reading my thesis!

Jill van der Bijl

Utrecht, February 2021

Abstract

Living labs as an innovative form of co-creation challenges public professionals in their daily work when they represent the local government in the living lab. Aiming to distinguish perspectives of public professionals on their roles and tasks in the living lab, Q-methodology was used and resulted in three perspectives: The representing professional, the online professional and the participating professional. The perspectives provide insight in the relation between the local government and the living lab and the research uncovered a small gap between theoretical knowledge about possible roles and how public professionals themselves identify them, empirically. The results of Q-methodology are not generalizable and therefore it could be interesting to further study the institutional context of living labs and how this context affects the roles and tasks of the public professional.

Keywords: Living lab, public professional, roles and tasks, q-methodology

Content

1. Introduction

The Municipality of The Hague is experimenting in Living Lab Scheveningen as part of the Healthy Coast innovation programme. Together with citizens and entrepreneurs, they want to test (digital) innovations in the areas of the boulevard, the dunes and the city of Scheveningen. For instance, piloting innovative products that could contribute to the protection of the coast area by limiting noise and polluting (Den Haag, n.d.).

Close to the coast of Scheveningen, Living Lab Care Robotics is located at The Hague University of Applied Science. Here, robotic products are tested for medical care in a real-life setting. The University of Leiden and Delft, Medical Delta and a healthcare organization together research, design and test robotic products in a multidisciplinary team (Vervloed et al., 2019). Here, knowledge, expertise and experience come together to work on innovative robotic products for medical purposes.

A living lab could be seen as "a physical or virtual space in which to solve societal challenges, especially for urban areas, by bringing together various stakeholders for collaboration and collective ideation" (Hossain, Leminen & Westerlund, 2019, p. 976). Stakeholders could be citizens, entrepreneurs, universities, companies and all sorts of (semi-)public institutions. In this research, they will be called participants. Following the case of Living Lab Scheveningen and Living Lab Care Robotics, "living labs are driven by two main ideas: 1) involving users as co-creators of innovation outcomes on equal grounds with the rest of participants and 2) experimentation in real-world settings" (Gascó, 2017, p. 91). A living lab is a form of co-creation (Hossain et al. 2019; Maas, van den Broek & Deuten 2017) that values the interests of all stakeholders, including local governments.

The role of local governments like municipalities is important due to the specific, local context of living labs (Maas et al., 2017) and because of their decision-making position (Kronsell & Mukhtar-Landgren, 2018). In order to let living labs develop and flourish for a longer period of time, there are certain challenges municipalities face. First, expertise and technology is needed to manage the process of design and implementation of living lab products. However, due to the variety of participants, knowledge and expertise is dispersed (Brandsen, Steen & Verschuere, 2018). Additionally, participants differ in capacities and resources which could lead to complications with technology (Hossain et al., 2019). Dispersed knowledge and expertise and different capacities and resources troubles management and implementation, but also affects the level of digital capacity of participants. The municipality

is challenged to anticipate on those different levels in order to include and empower all potential participants (Lember, 2018). Second, it is challenging for municipalities to up-scale products to other governmental levels and to sustain outcomes (Hossain et al. 2019; Maas et al. 2017). Living lab products and services are created within a local context and address local problems and situations. The process of up-scaling is difficult because other levels of government, like provincial administrations or larger municipalities, demand different solutions or have a different allocation of resources. Moreover, sustaining the created products or services is hard due to the experimental character of living labs. This leads to temporality of engagement of participants or unpredictable outcomes (Hossain et al., 2019), which could be challenging for municipalities because sustainability requires continuity and predictability.

Living labs could offer solutions for societal and urban problems, but challenge the municipalities at the same time. Therefore, there has been much research on co-creation and how governmental organizations should act in order to support co-creation processes and products (Voorberg, Bekkers & Tummers, 2015).

With this in mind, the question raises how public professionals as representatives of the municipality are challenged by living labs in their daily experience. Bovaird and Loeffler (2012) state that public professionals need to develop new professional capacities in order to sustain outcomes. There is also a shift in skills, where technical skills should be complemented with relational skills (van Eijk 2017; Steen & Tuurnas 2018). These skills are needed to complete different or new tasks of public professionals in case of living labs. For instance, networking skills are needed to fulfil their tasks as representatives of the municipality in the interaction between participants. This is useful, because public professionals need to adjust between the different interests of participants (Dezuanni et al, 2017; Kronsell & Mukhtar-Landgren 2018). Clearly, tasks in relation to living labs are changed. Studying tasks is interesting, because changing tasks shape new roles of public professionals (Steen & Tuurnas, 2018). The current literature provides insight in possible roles (McMullin 2020; Mortensen et al. 2020) based on co-creation and co-production theories. These studies provided knowledge about the role of public professionals in relation to citizens (McMullin, 2020) and the hybridity of roles (Mortensen et al., 2020), but empirical knowledge about the perspective of public professionals on their changing role is missing (Steen & Tuurnas, 2018).

However, it is interesting and valuable to study the perspective of public professionals on their tasks and roles. It is clear that when they work with, in or for living labs, they need to adapt new professional skills (van Eijk 2017; Steen & Tuurnas 2018) and adjust new roles (McMullin 2020; Mortensen et al. 2020). This process is not uniform for all public

professionals, because it also depends on the position municipalities choose in relation to living labs. Municipalities could be involved in several ways (Kronsell & Mukhtar-Landgren 2018; Maas et al. 2017), which indirectly affects the role of public professionals working with living labs. For instance, in Living Lab Scheveningen the Municipality of The Hague is leading the initiative and approaching other participants, like citizens and entrepreneurs, to engage in developing innovations for the area (Den Haag, n.d.). In contrast to the Living Lab Care Robotics, where the Municipality of The Hague is not even mentioned as a participant, but is administratively involved because the lab is localized in the area. The public professionals' perspective and daily experience could be different in every case, due to the different positions of municipalities. Knowledge about the different perspectives of public professionals and their viewpoint could provide insight in the relation between living labs and the local government. Second, it could be a starting point for learning activities and professionalization of public professionals working for and with living labs.

There is still little known about the perspectives of public professionals themselves on their role and tasks in general. Given the fact that these are changed and challenged with the riseof living labs, there is urgency to obtain insight in perspectives of public professionals. Therefore, the following research question is formulated:

How do public professionals identify their role and tasks in case of living labs?

The aim of this research is to distinguish perspectives of public professionals on their role and tasks in case of living labs. In the following section the theoretical framework will be presented. Co-creation theories will be discussed and compared to the existing academic knowledge about living labs. The divergences based on theory contributes to a better understanding of the theoretical concept of living labs and the role of the government, especially the public professionals' role. Empirical knowledge about the roles and tasks which public professionals identify is gained by performing Q-methodology. In the third part, this form of research and its application in this research will be explained and elaborated. As a result, three perspectives are distinguished and will be discussed in the fourth part. Finally, concluding words, contributions and limitations of this research and suggestions for further research are written in the fifth part.

2. Theoretical framework

In this section, co-creation and co-production theories are discussed and elaborated in relation to living labs. Then, living lab literature and co-creation theories are compared by discussing how living labs are a divergent form of co-creation. These divergences, the local context, the experimental character and the digital aspect, are seen as characteristics for living labs. Lastly, five roles and similar tasks will be discussed that could be identified by public professionals according to co-production and co-creation studies in relation to living lab theories.

2.1 Co-creation and co-production

The concept of co-creation is often combined with the concept of co-production. Studies use the concepts interchangeably, but there are several differences. Brandsen and Honingh (2018) noted the sector of origin as difference. Theories of co-production are developed in and for the public sector, whilst co-creation is recently adopted by the public sector but was originally designed in the private sector (p. 9). Therefore, the definition of co-creation in public administration is often vague and arbitrary. However, Voorberg et al. (2015) tried to characterize co-production and co-creation by conducting a systematic review of both concepts. They concluded that co-production and co-creation processes both include citizens as co-implementers, but also mention the role of co-designer and co-initiator. Brandsen and Honingh (2018) took this as their starting point to formulate the difference between co-production and co-creation: "Co-production is generally associated with services citizens receive during the implementation phase of the production cycle, whereas co-creation concerns services at a strategic level" (p. 13). This means that if citizens are involved by initiating or designing public services, the process is more likely to be defined as co-creation.

For this research, the findings of Voorberg et al. (2015) and the distinction of Brandsen and Honingh (2018) are leading for the further use of the concepts of co-production and co-creation. Co-production is the process where participants produce services or products by doing exploiting activities like implementing, delivering and evaluating. Participants perform on a tactical and operational level. Co-creation also relates to co-production processes, but differs from co-production by focusing on exploring activities like initiating, planning and designing products and services. Participants are involved as co-initiator and co-designer because their input, experience and expertise is valued. They perform not only on the operational and tactical level, but also on a strategic level. They create new knowledge by designing and developing innovative products and services or in other words, they act as co-creators.

Therefore, in the next section, the concept of living labs will be compared with co-creation theories, because living labs are a divergent form of co-creation. When the possible roles and tasks of public professionals are discussed, co-creation and co-production will be used. Using co-production theories will be used additionally because the current co-creation literature solely does not provide enough theoretical background to describe all possible roles and tasks that public professionals could identify.

2.2 Living lab literature and co-creation theories

Living lab theories and co-creation theories both contains the aspect of creating knowledge and how to transfer this new knowledge by learning. The initial purpose of living labs is to develop new ideas for products, services and systems (Hossain et al., 2019, p. 984). Here, participants create new knowledge in an iterative cycle of activities (Ballon, van Hoed & Schuurman, 2018). The iterative cycle consists of activities which focus on the process of designing and developing and can be understood as exploring activities. Exploring activities are characterized by "capturing, discovering, generating, and creating new knowledge and competences" (Hossain et al., 2019, p. 982). Hence, the living labs' iterative cycle of exploring activities forms a process of creating knowledge. For instance, Maas et al. (2017) describe living labs as workplaces for creation of knowledge.

The exploring activities can also be seen as learning activities, because knowledge and competences evolve during the process. Activities like initiating, designing and testing are followed by evaluation and repeated in a process of trial and error. Here, the iterative cycle is strengthened by the learning aspect of living labs (Ballon et al., 2018). The process of learning and transferring new knowledge should take place in the living lab during interaction between participants, according to Hossain et al. (2019). They argue that transferring knowledge to all participants is an indicator for the success of living labs. However, this is a challenging process.

Living labs theories and co-creation theories are also comparable in how their initiatives are challenged in transferring knowledge. Transferring knowledge is difficult because the variety of participants is high, due to dispersed knowledge and expertise (Brandsen et al., 2018) and differences in capacities and resources (Hossain et al., 2019). They complement each other's expertise and capacities during living lab activities. This implies that all participants win, but (technological) innovation is also characterized by competition. Some participants, like technological or governmental organizations, will have a better position than citizens regarding technological or political capacities (Lember, 2018). However, it could also be

possible that participating companies have technological advantages, because they are more innovative than governmental organizations. This makes the collaboration and interaction between participants complex.

Additionally, the interaction between the municipality and the participants depends on the chosen position of the municipality within the living lab. Municipalities differ in the way they are involved in living labs (Kronsell & Mukhtar-Landgren 2018; Maas et al. 2017). Maas et al. (2017) state that municipalities use living labs as policy tools to realize change in urban areas. In that case, municipalities fulfil the role of (change) agents (Maas et al., 2017) and there is municipal leadership (Kronsell & Mukhtar-Landgren, 2018). In contrast to the situation where the municipality is solely involved as area administrator, because the living lab is located and operative in their area (Maas et al., 2017). Here, the municipality is only administratively or financially involved, where they offer support with funding. Lastly, the municipality could function as an equal partner in the living lab in the form of shared leadership (Kronsell & Mukhtar-Landgren, 2018). The three described types of involvements are not exhaustive, but definitely affect the public professionals' roles and tasks in the living lab. After discussing how co-creation theories and living lab literature is comparable, it is important to explore the divergences, in order to define the characteristics of living labs.

2.3 Living lab as a divergent form of co-creation

An important divergence between living labs and co-creation is that living labs are always bound to their local or regional context. Co-creation could also take place on a national or even European level (Torfing, Sørensen, & Røiseland, 2019). In case of living labs, the created knowledge is based on and for the specific context where the living lab is located (Maas et al., 2017). Hossain et al. (2019) capture this in the concept of collaborative contextual innovation (p. 983). The context bound outcomes of living labs are beneficial for addressing local problems. However the contextual aspect troubles the process of upscaling and sustaining the outcomes (Hossain et al. 2019; Maas et al. 2017). Innovative products and services are not easily transferred to other governmental institutions or levels, because they are based on created contextual knowledge in living labs and address particular local problems and situations. Additionally, the organizational boundaries of a living lab are diffuse and makes them sensitive for "the complexity and uncontrollable dynamics of real-life environments" (Ballon et al., 2018, p. 3). According to Maas et al. (2017), the physical boundaries are not limited to a physical room or building, they stretch out to more real-live experiment environments such as streets,

neighbourhoods and even the entire city (p. 17). The environment and the lab are intertwined, which is challenging on both organizational and managerial as operational level. For instance, there needs to be a certain level of compliance regarding (cyber) safety, ethical norms and health regulations similar to regular labs. This could be difficult to realize for a public professional because a living lab does not have demarcated physical boundaries (Maas et al., 2017).

Another divergence is the experimental character of living labs. Following co-creation theories about exploring activities repeated in a process of trial and error suggest that every co-creation initiative contains some experiments. In case of living labs, the lab not only facilitates real-life experiments (Gascó, 2017) but could also be considered as an experiment itself. The experimental character could lead to temporality (Hossain et al. 2019) and unforeseen outcomes of living labs (Hossain et al., 2019). Living labs, their activities or participants' contributions could be temporarily due to short term focus on individual or organisational needs (Hossain et al., 2019). Consequently, participants are engaged temporarily and the acquirement and integration of new, similar participants is time-consuming. Additionally, living labs could have unforeseen or unpredictable outcomes (Hossain et al., 2019). It is hard to outline clear, long term achievements, because the evolving processes in living labs do not answer demarcated results. This could trouble the process of motivating and involving participants, because it is not clear how the living lab could serve their interests.

The last divergence that will be discussed in this study is the digital aspect of living labs. According to Lember (2018), living labs are new, innovative forms of co-creation. Living labs are an example of how new technologies transform traditional co-production and co-creation initiatives. Digitalization as new technology cannot be seen separately from living labs. For instance, a living lab can exist in a virtual form due to digitalization (Hossain et al., 2019). Here, the living lab activities take place on an online platform, where participants communicate and applications are gathered. The virtual form of living labs could affect the tasks of public professionals. As an example, they should be able to work with online communication systems. The transformation from traditional to innovative and digital forms of co-creation has an impact on the empowerment, participation and inclusiveness of citizens, the efficiency and effectiveness of projects but more interesting, the new tasks and capabilities of the government (Lember, 2018). The impact would lead to a mediator role of the government, where they are sponsoring, mobilizing and monitoring new innovative forms of co-creation, like living labs. Consequently, there is reallocation of tasks and roles of participants and the government (Lember, 2018) and this affects the public professionals' roles and tasks.

Comparing living lab literature and co-creation theories provides a better understanding of the theoretical concept of living labs. Living labs are a divergence form of co-creation, because the local context, the experimental character and the digital aspect are related to co-creation theories, but are not automatically a characteristic for every co-creation form or initiative. Therefore, the divergences can be seen as characteristics for living labs.

2.4 Roles and tasks

As written above, living lab theories and co-creation theories both contains the aspect of creating knowledge in an iterative cycle and how to transfer this new knowledge by learning and doing exploring activities. Living labs are a divergent from co-creation due to their local context, their experimental character and their digital aspect. To identify roles and tasks of public professionals, co-production and co-creation theories are used. As stated before, co-production theories will be used additionally to capture all possible roles and tasks. Co-production theories are focussed on activities on an operational and tactical level and co-creation on a strategic level, but still includes basic, practical co-production activities like implementing. Tasks especially are performed on operational level and could be overseen when only co-creation studies are revised, because they tend to focus more on strategic activities. Therefore, co-creation theories are complemented with co-production theories in order to explore all possible roles and tasks. This resulted in five roles and similar tasks which could be identified by public professionals. Public professionals could be *enablers*, *facilitators*, *motivators*, *coordinators* and *translators*.

2.4.1 Enabling

Public professionals perform as enablers (McMullin 2020; Mortensen et al. 2020; Jaspers & Steen 2019; Steen & Tuurnas 2018). In other words, they connect participants (online) in order to enable processes of co-creation. In the case of living labs, public professionals need to know how participants' expertise and resources can complement each other. Relational skills and networking capacities are essential to perform as an enabler (McMullin 2020; Steen & Tuurnas 2018). The public professional takes the role of a friend by actively creating trust between citizens, organizations and themselves (Vanleene, Voets and Verschuere, 2017).

2.4.2 Facilitating

Public professionals are facilitators of co-production or co-creation (McMullin 2020; Steen & Tuurnas 2018). Facilitating tasks means that public professionals provide (online) platforms where participants can interact (Tuurnas, 2015) and other services such as applications and new

technologies (Lember, 2018). Living labs are characterized by the idea of piloting products in real live settings (Gascó, 2017). Therefore, the public professional should facilitate a test location where these experiments can take place, like the care robots in case of the Care Robotics Living Lab. Moreover, project management is necessary to keep participants on track and ensure that deadlines are passed (McMullin, 2020).

2.4.3 Motivating

Public professionals could identify themselves as motivators (Mortensen et al. 2020; Jaspers & Steen 2019; van Eijk 2017). Motivating participants is necessary to keep them involved and engaged in co-production or co-creation projects. Living labs address different urban or societal problems, where various participants can contribute to achieve the best results. Hence, motivating also requires obtaining information about motives of potential participants in order to get them involved (Steen & Tuurnas, 2018). Citizens and organizations need to be actively included, which can be achieved by a responsive and inclusive approach of public professionals (Mortensen et al., 2020). Therefore, motivating can be seen as an extension of the enabling tasks because the public professional first needs to create a bond and is then able to anticipate their needs and motivations. Inclusiveness can be enhanced by digitalization, but there are also studies that show that specific groups of citizens, like elderly, are excluded (Lember, 2018). Not only the digital aspect of living labs is changing this task, the experimental character is challenging the motivator role. The temporality and unforeseen outcomes could negatively affect the motivation of participants (Hossain et al., 2019). Hence, the public professional needs to manage expectations of the participant to keep them motivated, but also be transparent about realistic outcomes.

2.4.4 Coordinating

Public professionals could be coordinators of co-production of co-creation objectives (McMullin 2020; Mortensen et al. 2020; Steen & Tuurnas 2018). They need to formulate and manage goals and interest of their own organization (Mortensen et al., 2020). Vanleene et al. (2017) consider this as the representative role, because in this role the public professional represents the objectives of the municipality, but at the same time represents the project to authorities beyond participants. Though the public professionals' coordination is necessary to ensure the interest of participants are addressed too. This could be seen as a mediator role (Vanleene et al., 2017). In case of living labs the coordinating role and task could be identified as two-folded. On one hand, they are representing municipal objectives and ensure these are addressed in living lab activities, as a representative. On the other hand, the public professional

is trying to value participants' interests, as a mediator. For instance, in the Living Lab Scheveningen, where entrepreneurs are also involved as participants and have interest in profits for their enterprise in the coast area. The coordinator role and coordinating tasks could be seen as being both a representative as a mediator.

2.4.5 Translating

Lastly, public professionals could see themselves as translators (Tuurnas, 2015). The translating role implies that the public professionals translate outcomes to the organization of the municipality. Ballon et al. (2018) stresses the urgency for demonstrating the value of living labs, but acknowledges the difficulty in assessing the outcomes in demarcated models. Moreover, the unforeseen and unpredictable outcomes (Hossain et al., 2019) troubles the translating tasks. (Hossain et al., 2019). Nevertheless, in order to create value for co-creation projects, public professionals need to analyse results and illustrate them in a meaningful manner (Tuurnas, 2015).

The theoretical framework discussed co-creation literature in relation to co-production studies, provided insight by comparing co-creation theories and living lab literature and described how complex the living lab network is due to the possible positions of municipalities in living labs. To better understand the theoretical concept of living labs, living labs are discussed as a divergent form of co-creation. These divergences led to three theoretical characteristics of living labs. They challenge the public professional in his or her existing roles and tasks, described in the former paragraphs.

However, there is still a gap between the position of the municipality in combination with the characteristics of living labs regarding tasks and roles of the public professional: the perspective of the public professional on his or her tasks and roles in the living lab. The existing literature provides possible roles and tasks which could be useful to better understand which roles and tasks public professionals could fulfil. However, empirical knowledge is necessary to uncover how public professionals themselves are identifying their tasks and roles. First, because there might be other tasks, roles, responsibilities or positions which are not captured in the existing literature. Second, the existing roles do not provide insight in the professionals' motives or attitudes. Therefore, it is necessary to perform a study offers that is open to all possible points of view. At the same time, the method should allow the researcher to obtain a comprehensive understanding of each perspective, by uncovering why they identify certain tasks or roles. In the next section, the research method which aims this, will be presented.

3. Methodology

In this part of the study, Q-methodology as the chosen research method will be justified and further explained. Q-methodology has a step by step approach, consisting of the development of a set of statements (Q-set), the selection of respondents and the analysis of the Q-sorts (completed Q-sets).

3.1 Q-methodology

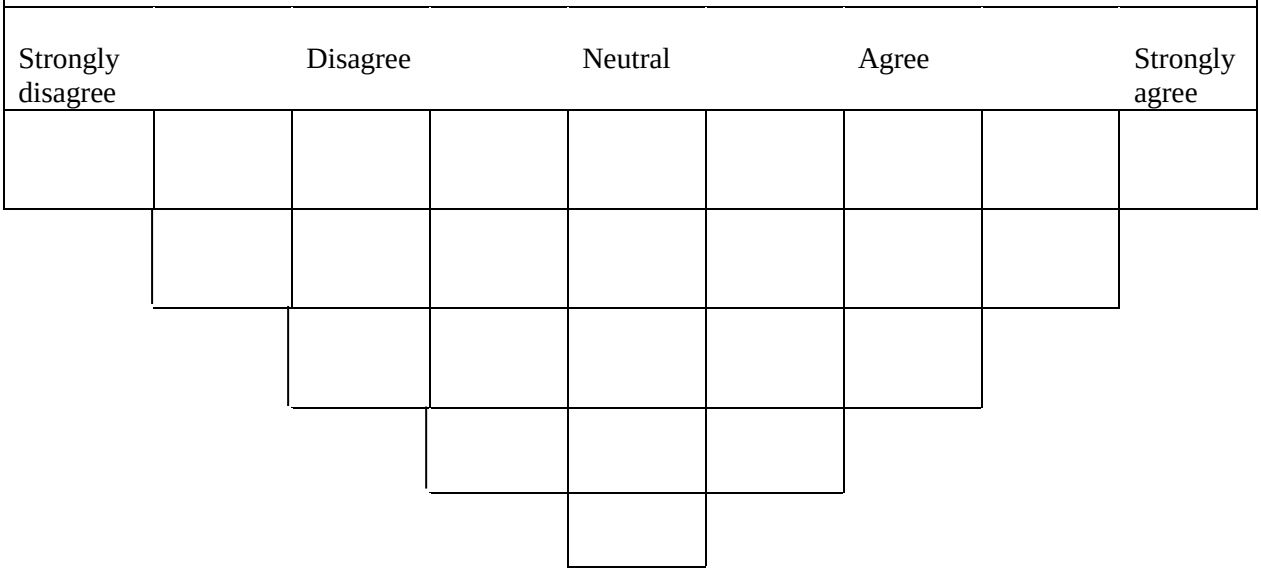
This research aims to distinguish perspectives of public professionals on their role and tasks in case of living labs. It is not about measuring differences, but crystallizing different perspectives. Therefore, q-methodology is chosen, because it "is designed to facilitate the expression of personal viewpoints" (Watts & Stenner, 2012, p. 53). In public administration studies, q-methodology is becoming more popular to study roles and practices (Durose et al., 2016). That is because Q-methodology is useful to explore "the part of personality that is of great influence on behaviour but that often remains largely unexplored" (van Exel & de Graaf, 2005, p. 2). Hence, it could reveal why people act in a certain way. The method is hybrid, because it uses qualitative and quantitative research methods. Respondents are asked to rank statements, the Q-set, related to the research topic based on their own view in a table, the Q-sort (Jedeloo & van Staa, 2009). Respondents need to sort statements in relation to other statements, which results in a complete, personal point of view (van Eijk, 2017). The Q-sort form makes it possible to compare the statements statistically (Durose et al., 2016). The analysis shows which Q-sets are highly correlated and therefore can be distinguished as different perspectives of public professionals. Hence, the combination of methods "allows researchers to uncover shared perspectives and relationships between themes, thus understanding 'the whole'" (van de Grift, Cuppen & Spruit, 2020, p. 3). In other words, uncovering how public professionals identify their role and tasks in case of living labs is possible by doing q-methodology. Therefore, the step by step approach of Q-methodology will be further discussed in this section.

3.2 Developing Q-set

The Q-set is structured, which means that the research topic is divided into sub-themes based on theory, previous research or observations (Watts & Stenner, 2012). The first Q-set was developed based on academic literature discussed in the theoretical framework. It was formulated in Dutch and consisted of 30 statements. These were revised by a field expert, namely the account manager Digital Innovations of a large municipality and an academic

expert, a professor specialized in public governance and the role of public professionals. This revision was important for the validity of Q-methodology research, because the experts submitted comments on the content of the statements or the use of language for the statements (Akhtar-Danesh, Baumann & Cordingley, 2008). In this way, the statements were close as possible to the daily practice of the public professional but at the same time reflecting academic concepts. According to van Exel and de Graaf (2005), further validity in Q-methodology is not possible assuming that there is no criteria to assess someone's personal point of view. Reliability is also difficult in Q-methodology but can be addressed in the form of replicability (van Exel & de Graaf, 2005). If similar perspectives will be the result of the same Q-set sent to different persons, the Q-set is replicable. However, it is important that a well-structured Q-set should contain statements that link to a wide range of views to explore all possible perspectives (van Exel & de Graaf, 2005). After the revision of the experts, the final Q-set consists of 25 statements. These statements will be ranked by the respondents using figure 1.

Figure 1: Distribution of statements



The form of the distribution forces the respondents to choose how strongly they (dis)agree with a statement. There are a minimum number of cells for strong (dis)agreement, which results in the form of an inverted pyramid. This form is chosen because "a small part of the statements is expected to be salient" (van Exel & de Graaf, 2005, p. 6). In other words, the respondents are not expected to have a strong opinion about every statement. Hence, there should be room for indecisiveness by offering more cells in the middle part of the distribution (van Exel & de Graaf, 2005). In this research, the Q-set contains 25 statements, which are categorized in multiple

dimensions. Each cell contains four statements, but in order to reach the number of 25 statements, one cell has five statements, as presented in figure 2.

Figure 2: Statements matrix

Characteristics / **Category**	**Local context**	**Experimental character**	**Digital aspect**
Competencies and responsibilities	4 statements	4 statements	4 statements
Roles and positioning	4 statements	5 statements	4 statements

First, the statements are related to the characteristics of living labs described in the theoretical framework, namely the local context, the experimental character and the digital aspect. The aim is to obtain more knowledge specifically about tasks and roles in case of living labs. Therefore, the characteristics are chosen as dimensions and not similarities between co-creation theories and living labs or co-creation theories. The dimensions of characteristics provide perspectives and viewpoints of public professionals that will be based on specific living lab characteristics.

Second, the statements are categorized in two groups; ‘competencies and responsibilities’ and ‘roles and positioning’. The category ‘competencies and responsibilities’ focus on tasks of public professionals, because it covers different aspects of daily work regarding living labs and possible responsibilities for certain parts of living lab activities. Statements include phrases as ‘be able to’ or ‘be responsible for’ or refers to information which the public professional possesses (or not). The category ‘roles and positioning’ relates to the roles of public professionals, because it covers possible roles public professionals could fulfil in the living lab and certain positions a public professional could take in the living lab. Statements refer to possible roles, positions or viewpoints regarding other participants in the living lab network. The three dimensions of characteristics and the two categories were chosen because it covers roles and tasks which public professionals could identify in case of living labs.

Lastly, the formulation of the statements as part of the development of the Q-set will be discussed. The five roles and similar tasks written in the theoretical framework served as an inspiration for the statements. To formulate statements that would relate to daily tasks and experiences, it was helpful to use the theoretically based roles and tasks as a starting point. Nevertheless, the five roles and tasks were not the foundation for the dimensions because it could lead to demarcated roles and tasks. Hence, the perspective of the public professional could

be not fully personal or complete. Additionally, while formulating the statements it was taken into account that the statements should be descriptive and prescriptive as well. Based on the theory of Dryzek and Berejikian (1993) about different types of formulation, the statements were attempted to be formulated descriptively and prescriptively. In this way, statements became more distinctive to prevent generality or similarity.

Table 1: List of statements

Number	**Statements in Dutch and English**
1	*Ik ken de expertise en toegevoegde waarde van deelnemende organisaties.* I know the expertise and contributed value of participating organizations.
2	*Het projectmanagement is mijn verantwoordelijkheid.* Project management is my responsibility.
3	*Ik vind het lastig om de belangen van de deelnemende organisaties in kaart te brengen.* I experience difficulties demonstrating the interests of participating organizations.
4	*Ik ben goed in staat onze resultaten op een visueel aantrekkelijke manier te presenteren.* I'm capable of presenting our results visually attractive.
5	*Het is moeilijk om potentiële organisaties te werven voor deelname door het experimentele karakter van het living lab* It is difficult to attract potential organizations to participate due to the experimental character of the living lab.
6	*De resultaten zijn niet in cijfers uit te drukken.* The results can't be described in numbers.
7	*Ik ben de mediator tussen de deelnemende organisaties.* I am the mediator between participating organizations.
8	*Ik ben bang dat burgers worden uitgesloten van deelname door digitalisering.* I am afraid that citizens will be excluded to participate due to digitalization.
9	*De motivatie van deelnemers hangt af van successen op de korte termijn.* Participants' motivation depends on short term successful results.
10	*Het voortbestaan van het living lab is afhankelijk van de gemeente.* The continuation of the living lab is depending on the municipality.
11	*Lange termijn visie ontbreekt in mijn living lab.* Long term vision is absent in my living lab.
12	*Ik moet zichtbaar maken wat de lokale / regionale waarde is van onze eindproducten.* It is my job to demonstrate the local / regional value of our products.
13	*Ik ben de verbinder tussen de deelnemende burger en de activiteiten van het living lab.* I make the connection between participating citizens and the living lab activities.
14	*Door digitalisering kan ik deelnemers beter bereiken.*

	Due to digitalization I am better able to reach participants.
15	*De belangen van de gemeente in het living lab project zijn belangrijker dan de belangen van de andere deelnemers.* The municipality's interests in the living lab project are more important than the interests of the participants.
16	*Digitalisering is essentieel voor het succesvol functioneren van het living lab*. Digitalization is essential for the living lab to operate successfully.
17	*Ik weet wat de deelnemende organisaties motiveert om deel te nemen aan het living lab.* I know what participating organizations motivates to participate in the living lab.
18	*Het netwerken tussen en met deelnemers is makkelijker door digitalisering.* Networking between and with participants is easier due to digitalization.
19	*Ik dien de belangen van de deelnemers ten behoeve van de uitwisseling van kennis in de regio.* I serve the participants' interests as part of the exchange of knowledge in the region.
20	*Het netwerk waarin het living lab opereert is zeer complex.* The network wherein the living lab operates is very complex.
21	*Ik weet vooraf wat het eindproduct gaat worden*. In advance, I know what the product is going to be in the end.
22	*Het living lab is één organisatie; organisatiegrenzen zijn vervaagd.* The living lab is an organization as a whole; organizational barriers are diminished.
23	*Ik kan goed online communiceren met de deelnemers.* I am able to communicate properly online with the participants.
24	*De verwachtingen van deelnemers zijn moeilijk te realiseren door korte termijn denken.* Expectations of the participants are difficult to fulfil due to short term thinking.
25	*Ik ben verantwoordelijk voor de toegankelijkheid van het (online) platform.* I am responsible for the accessibility of the (online) platform.

3.3 Selecting respondents

The research studies the perspective of public professionals who work with living labs. Therefore, possible respondents need to 1) be a public professional working for a municipality and 2) fulfil a function like project manager, project coordinator, contractor or contact in a living lab. In order to explore as many points of view as possible, all sorts of public professionals were addressed, disregarding the geographical location, policy sector, time of existence of their living lab or the position of their municipality in the living lab.

Possible respondents are contacted via email, obtained by public websites of living labs or via personal networks. In total, 47 organizations / persons were contacted in one week. They were first informed about the research and asked to participate. After two weeks, 21 public

professionals agreed to participate. The final respondent group is less diverse than the aimed participant group, because some of the respondents worked for the same municipality. In total, 14 municipalities were represented by 21 respondents.

The respondents received an email with instructions and the Q-sort. According to van Exel and de Graaf (2005), there is no difference regarding validity or reliability if the Q-sorts were sent by email instead of doing an interview. Respondents could choose between a Q-sort in PDF-format and a Q-sort in Word-format. The online software for Q-sorting was not available so therefore these formats were used. Additionally, respondents had to complete a survey consisting of six questions. Three demographic questions were about their age, gender and former education. Connections could appear between the professionals' demographic background and his or her perspective. For instance, age and former education could affect his or her digital capabilities. Therefore, demographic information could provide a more comprehensive understanding of the perspectives of the public professional. Additionally, three questions were related to the living lab they work for, namely the average number of hours they work for the living lab per week, if the living lab uses an online platform and for what purposes the living lab exists (e.g. urban planning, healthcare, etc.). This information gives more insight in the possible connection between the living lab and the public professionals' perspective. As an example, the average number of hours professionals work for the living lab could affect their contribution to living lab activities and consequently their perspective on their tasks. The connections which might appear are not representative for a larger population, because the sample is too small.

Two weeks after the moment public professionals received the Q-sort, 18 Q-sorts were completed. One respondents refused to fill in the Q-sort because he / she was not comfortable with the statements and two respondents never responded after they received the Q-sort. In Q-methodology, it is statistically beneficial to select less respondents than the number of items in the Q-set (Watts & Stenner, 2012). Hence, 18 completed Q-sorts are sufficient for this research, because there are 25 statements.

3.4 Analysis

For the analysis of the Q-sorts, the software of PQmethod is used (Schmolck, 2014). This software provides the possibility to analyse the completed Q-sorts. The procedures were done by performing Principal Component Analysis and Varimax (Schmolck, 2014). First, it was possible to calculate the correlation between the Q-sorts by using Principal Component Analysis (PCA). If each respondents had a specific, unique point of view, there was no

correlation between the Q-sorts. If Q-sorts are correlated, they can be traced and clustered into a factor, which represents a shared point of view or a shared perspective (Jedeloo & van Staa, 2009). The factor analysis of PQmethod software can trace eight factors maximum (Schmolck, 2014) The PCA was chosen because it calculates the Eigenvalue of the unrotated factor. According to the widely accepted Kaiser-Guttman criterion, factors should be extracted when the Eigenvalues is more than 1.00 (Watts & Stenner, 2012). Five factors had an Eigenvalue higher than 1.00.

The extraction provides information about the factors that are significantly loaded, the rotation aims to show if Q-sorts load heavy or weak on certain factors. Moreover, rotation forces Q-sorts that are not in a specific factor, are categorized in one of the selected factors. The process of rotation could be performed by hand but in this research, Varimax is used for automatic rotation. According to Watts and Stenner (2005), many Q-methodologists use this because of the simplicity and the reliability of the Varimax process (p. 81). Additionally, rotation by hand was not necessary because there was no theoretical ground (Akhtar-Danesh et al., 2008). In other words, the research does not focus specifically on demographic backgrounds of the respondents in relation to their point of view. This would demand a rotation by hand, but this research focuses primarily on subjectivity and all possible points of view.

When factors are rotated by Varimax, it is important to look at the number of defining Q-sorts for each factor. A factor is selected for interpretation if it has "at least two Q sorts that load significantly upon it alone" (Watts & Stenner, 2005, p. 81). This means that the factor is characterized by at least two individual Q-sorts (Watts & Stenner, 2012). Practically, two to four defining Q-sorts for each factor is suitable (van Exel & de Graaf, 2005). Factor 4 and 5 had only two defining sorts and factor 1, 2 and 3 had three or more defining sorts. After rotating with three and four factors, three factors were chosen to be a definitive number of factors. In comparison, four factors would result in four Q-sorts (of 18 Q-sorts) that would not load on any factor, but with three factors, only two Q-sorts would not load. Table 2 demonstrates the factors loadings.

Table 2: Factor loadings (X indicates a defining sort)

Q-sort	**Factor 1**	**Factor 2**	**Factor 3**
1	-0.0143	0.7764X	0.2478
2	0.0099	0.4100X	0.0841
3	0.1297	-0.0340	0.4624X

4	0.2838	0.7903X	-0.1597
5	0.7625X	0.3280	0.1465
6	0.5377X	0.5204	0.1215
7	0.7021X	0.1533	0.1204
8	0.3192	0.3081	-0.4136
9	0.6915X	-0.0531	0.2755
10	0.7868X	-0.3860	-0.2198
11	0.0673	0.1135	0.3961X
12	0.6650X	-0.1259	0.4625
13	0.3205	0.3027	0.6044X
14	-0.1580	0.6550X	-0.0793
15	0.4663	-0.4280	0.3778
16	0.4702	-0.0212	0.5426X
17	0.0033	0.3422	0.5868X
18	0.1019	-0.1606	0.7781X

In total, 16 Q-sorts of 18 completed Q-sorts loaded significantly on one factor. The most Q-sorts loaded on factor 1 and factor 3, namely both six Q-sorts, and four Q-sorts loaded on factor 2. These were the more statistical, quantitative approaches for analysing the data. In the next section, the qualitative approach will follow by changing the factors into meaningful perspectives of public professionals. To translate the factors into perspectives, the defining statements of each factor will be used. Defining statements are the statements which are ranked on the top grid positions (strongly agree or disagree) based on the z-scores. The z-scores can be used to demonstrate how the statements are ranked when a respondents' Q-sort loads 100 percent on a factor (Jedeloo & van Staa, 2009). In order to further describe and explain the perspectives, it is important to compare them and understand how they differ from each other. This can be achieved by using the distinguishing statements. A distinguishing statement is a statement that has significantly different grid position in comparison to other factors (Jedeloo & van Staa, 2009). At this point, the factors will be translated into meaningful perspectives of professionals. Therefore, from here, the term 'perspective' is used instead of factor and Q-sorts will be referred to as 'professionals'.

4. Results

The results will be discussed by using the defining and distinguishing statements. Each perspective is described using the defining statements in the figures below the description of the perspective. Statements that are relevant for the factor, but are not captured in the defining statements have their grid positions based on the z-score mentioned after their statement number. In the second part, the distinguishing statements will be used for a further analysis and understanding of the perspectives.

4.1 Perspective 1: The representing professional

Following table 3, professionals that identify with perspective 1 are aware of the complexity of living lab processes, because they find the network complex (statement 20) and do not know what the end version of products and services are going to be (statement 21). They tend to have an enabling role by having a strong confidence about knowing the expertise and contributing value of the participants (statement 1), being able to communicate online with the participants (statement 4, +2) and not experiencing difficulties with demonstrating their interests (statement 3, -2). Professionals score positive on roles, like being a mediator (statement 7, +1) and connector (statement 13, +1) between participants. Hence, they want to enable participants in order to let the living lab grow, but they score neutral about the responsibility for project management (statement 2, 0). This indicates that the professionals of perspective 1 do not see themselves as facilitators, but rather identify themselves as an enabler and representative of the municipality. They do not value the interests of the municipality more than the participants' interests (statement 15), but do believe that the continuation of the living lab is depending on the municipality (statement 4, +2). The idea of dependency could be explained by the fact that the professionals identifying with perspective 1 work for a municipality that initiated and leads the living lab and there is some form of municipal leadership (Kronsell & Mukhtar-Landgren, 2018) or the municipality fulfils the role of (change) agent (Maas et al., 2017). That also explains why professionals of perspective 1 disagree with the idea that long term vision is absent in the living lab (statement 11, -2), probably because the municipality has a long term plan and the living lab depends on it. However, the long term vision does not include a concrete product or service, regarding the low score on statement 21.

Professionals of perspective 1 have a negative attitude towards digitalization. Digitalization is not necessary to let the living lab function (statement 16) and does not make it easier to reach participants (statement 14, -1) or the living lab network (statement 18, -2).

Professionals in perspective 1 are focussed on enabling living lab processes, but are not likely to do the project management. They acknowledge the interest of the participants, but the active presence of the municipality is necessary. This indicates that the professional is on the one hand enabling participants to participate and on the other hand speaking for the municipality and therefore called the representing professional.

Table 3: Defining statements perspective 1

Number	**Statement**	**Perspective 1**	Perspective 2	Perspective 3
1	I know the expertise and contributed value of participating organizations	**4**	2	2
6	The results can't be described in numbers	**3**	3	1
20	The network wherein the living lab operates is very complex	**3**	0	0
16	Digitalization is essential for the living lab to operate successfully	**-3**	3	0
15	The municipality's interests in the living lab project are more important than the interests of the participants	**-3**	-1	-3
21	In advance, I know what the product is going to be in the end	**-4**	-1	-2

4.2 Perspective 2: The online professional

Professionals that identify with perspective 2 score low on statements about responsibilities for the accessibility of the (online) platform (statement 25) and project management (statement 2, -2) and they do not identify themselves with a role like connector (statement 13). The relationships between the participants and the professional is concise. On one hand, the professionals know the expertise of the participants (statement 1, +2) and are not experiencing difficulties with demonstrating their interests (statement 3, -2). On the other hand, they are sceptic about long term vision of the living lab (statement 11, +2) and strongly associate participants' motivation with short term achievements (statement 9). In general, they found the experimental character of the living lab difficult to deal with, especially when attracting potential participants (statement 5, +2). It might be possible that professionals identifying with perspective 2 work for a municipality that has chosen to not fulfil an active role in the living lab, but is rather administratively or financially involved (Maas et al., 2017).

Professionals in perspective 2 are not primarily connected to their local environment, because exchange of knowledge is not the reason to serve the participant (statement 19) and is neutral about demonstrating the local value of living lab products or services (statement 12, 0).

The professional who identifies him- / herself with perspective 2 scores high on the digital aspect. They consider it as essential for the successful functioning of the living lab (statement 16) and are positive that it simplifies networking (statement 18, +2). Therefore, professionals of perspective are called the online professional. This also captures the distance between the public professional and the living lab, following the concise attitude towards participants and the region. Hence, the public professional in perspective 2 is more likely to perform (mentally) on distance regarding living lab processes rather than actively enabling or facilitating living lab processes and therefore called the online professional.

Table 4: Defining statements perspective 2

Number	**Statement**	Perspective 1	**Perspective 2**	Perspective 3
9	Participants' motivation depends on short term successful results	0	**4**	0
16	Digitalization is essential for the living lab to operate successfully	-3	**3**	0
6	The results can't be described in numbers	3	**3**	1
19	I serve the participants' interests as part of the exchange of knowledge in the region	0	**-3**	2
13	I make the connection between participating citizens and the living lab activities	0	**-3**	0
25	I am responsible for the accessibility of the (online) platform	1	**-4**	-2

4.3 Perspective 3: The participating professional

According to the defining statements for perspective 3 in table 5, professionals that identify with this perspective feel responsible for the project management (statement 2) and the mediation between participants (statement 7). However, he or she feels not responsible for accessibility of the (online) platform (statement 25, -2). The professional is strongly connected to the local environment, because it scores high on demonstrating the contributed value of the living lab (statement 12) and on serving the interests aiming to exchange knowledge in the region (statement 19, +2). The interests of the municipality are equal to the participants' (statement 15) and the continuation of the living lab is absolutely not depending on the municipality (statement 10). The professional of perspective 3 scores negatively about seeing the living lab as one organization (statement 22, -2), which suggests that the professional acts

with the idea that the living lab consists of multiple groups of organizations and citizens, just like the municipality.

The professional of perspective 3 strongly disagrees with the idea that citizens would be excluded from participation due to digitalization (statement 8). Additionally, the professional is positive about the role of digitalization in ways to reach out to participants (statement 14, +1). Hence, the professional acknowledges that digitalization is an opportunity for the living lab, but is neutral about the necessity for the living labs' functioning (statement 16, 0). Professionals that identify with perspective 3 participate in the living lab by strongly feeling responsible for project management. Additionally, they are strongly connected to the region and see opportunities for the living lab in digitalization. Following the statements about the position of the municipality, they consider participants equal and not depending on the municipality for the continuation of the living lab. The municipality that they represent is only one organization of many, but has chosen to play a role as an equal participant, which might look like a form of shared leadership (Kronsell & Mukhtar-Landgren, 2018). The professionals actively participate in living lab processes and therefore called the participating professional.

Table 5: Defining statements perspective 3

Number	**Statement**	Perspective 1	Perspective 2	**Perspective 3**
2	Project management is my responsibility	0	-2	**4**
7	I am the mediator between participating organizations	1	0	**3**
12	It is my job to demonstrate the local / regional value of our products	1	-1	**3**
10	The continuation of the living lab is depending on the municipality	2	1	**-3**
15	The municipality's interests in the living lab project are more important than the interests of the participants	-3	-1	**-3**
8	I am afraid that citizens will be excluded to participate due to digitalization	0	-1	**-4**

4.4 Distinguishing statements

In order to describe and explain the perspectives on a deeper level, it is important to compare them and understand how they differ from each other. In this part, the distinguishing statements demonstrated in table 6 will be used.

Table 6: Distinguishing statements

Number	Statement	Perspective 1: Representing	Perspective 2: Online	Perspective 3: Participating
16	Digitalization is essential for the living lab to operate successfully	-3	3	0
10	The continuation of the living lab is depending on the municipality	2	1	-3
2	Project management is my responsibility	0	-2	4

Following statement 16, there is a high difference in the way professionals think about digitalization. The participating professional has a neutral score, but the representing professional and the online professional are strongly (dis)agreeing with the statement. The online professional, in respect of the name, truly believes in the opportunities of digitalization and even considers it as essential for the living labs' functioning. In contrast to the representing professional, who does not think that digitalization is essential or can be used to better reach out to living lab participants (statement 14) and the network (statement 18). This difference indicates that the representing professional defines his or her roles and tasks separately from the digital aspect of living labs, where online professionals identify the digital aspect as part of their role. Digital assets could replace certain tasks of the public professional. This might be a motive for them to be less connected to living lab processes, because they believe that digitalization reallocates tasks which results in a more distant role for the public professional.

The most distinguishing statement between the representing professional and the participating professional is their viewpoint on the position of the municipality (statement 10). They disagree on the level of dependency on the municipality regarding the living labs' further existence. The representing professional thinks the living lab network is complex and might therefore feel responsible for enabling tasks. Another explanation could be the long term vision of the living lab. Perspective 1 is negative about the absence of long term vision (statement 11, -2) in contrast to perspective 2 (+1) and perspective 3 (0). This could be explained by the idea that the representing professional follows the vision which the municipality formulated and

where the living lab depends on. That could also explain why the representing professional experiences the living lab network as complex (statement 20, +3) and the other perspectives score neutral. As a result of the formulated vision and dependency of the municipality, the representing professional is trying to involve and motivate participants which could increase their awareness of the networks' complexity. However, regarding the interests of the municipality, both perspectives disagree with the idea that the interests of the municipality are more important than the participants' interests (statement 15). The three professionals are all working for the municipality, but it is more likely that the representing professionals identify their role as deputies in a form of municipal leadership (Kronsell & Mukhtar-Landgren, 2018) rather than the other professionals.

The distinguishing statement between the online professional and the participating professional is the level of responsibility they feel for project management (statement 2). The online professional might consider digital assets as replacement for project management tasks. However, the participating professional is focussed on project management and therefore very attached to living lab processes. The involvement of participants are important which explains why the participating professional sees them self as mediator between participants (statement 7, +3), more than the representing professional (+1) and the online professional (0).

Another distinguishing aspect of the results is how connected the professionals are to their local environment, demonstrated in table 7.

Table 7: Distinguishing statements regarding local context

Number	**Statement**	**Perspective 1: Respresenting**	**Perspective 2: Online**	**Perspective 3: Participating**
19	It is my job to demonstrate the local / regional value of our products	0	-3	2
12	I serve the participants' interests as part of the exchange of knowledge in the region	1	-1	3

Statements 19 and 12 both relate to the attitude towards the local environment. The participating professional is more connected to the region than the online professional. It is interesting that the online professional could demonstrate the living labs' local value using digital and / or online assets but does not identify that as his or her tasks. The participating professional is more likely to be focussed on the region, because they are more eager to demonstrate the contributing

value of the living lab. Moreover, the participating professional considers the exchange of knowledge as a driver to serve participants' interests and the online professional not. Hence, the distinguishing statements regarding the project management and the local context imply that the participating professional, attached to living lab processes and the region, is more likely to act in terms of shared leadership (Kronsell & Mukhtar-Landgren, 2018) and the online professional is rather administratively or financially involved (Maas et al., 2017).

Regarding the demographic questions, there was only one possible connection between the demographic information of the public professional and his or her perspective. Respondents who identified with the online professional were all men. In contrast to the perspective of the representing professional, which was identified by five women and only one man. It was not possible to make a connection between background information related to the living lab and the public professionals' perspective.

5. Conclusion

The aim of this research was to distinguish perspectives of public professionals on their role and tasks in case of living labs. Comparing co-creation theories and living lab literature in the theoretical framework, was useful to get a better understanding of the theoretical concept of living labs. The possible tasks and roles which were described in the second part of the theoretical framework served as an inspiration for the statements. To uncover the perspective of the public professional, Q-methodology was used and resulted in three different perspectives of public professionals on their roles and tasks; The representing professional, the online professional and the participating professional. The representing professional focuses on enabling tasks and roles, is sceptic about digitalization and its opportunities and represents the municipality as a powerful participant. In contrast to the participating professionals, who do not think the living labs' continuation depends on the municipality. The participating professional considers digitalization as an opportunity for the living lab and the interaction between its participants. The participating professionals are involved in living lab processes and see project management as one of their main tasks, where the online professional does not strongly identify responsibilities or process related tasks. The online professionals are more likely to operate distantly regarding their attitude towards participants and the region. Additionally, the online professional is convinced of the necessity of digitalization for the living lab and truly believes in its opportunities.

The results imply that the representing professional is more likely to work for a municipality that is leading the living lab initiative rather than the online professional or participating professional. The last one is most likely to work for a municipality that acts like a regular participant with shared leadership, where the municipality of the online professional seems to be absent as a participant and does not play a role, but are administratively or financially involved because of the living labs' location.

5.1 Contributions

The main contribution of this research are the three found perspectives as result of Q-methodology. The three different perspectives present the daily experience of public professionals, dealing with different chosen positions of municipalities and therefore providing insight in the relation between living labs and the local government. Second, the results demonstrate that there are at least three perspectives that public professionals could have. The defining statements of each perspective provide information about the profile of the public professionals and how they identify their roles and tasks. The research uncovered a small part

of the gap between the theoretical knowledge about possible roles and how public professionals themselves identify them, empirically. Third, it also provides knowledge about how each type of professional is challenged in their daily work with living labs. This information could be a starting point to further develop learning activities, for instance, more specialized workshops. Moreover, the three different perspectives could also strengthen the awareness of public professionals about the different ways of working with living labs and how they might exchange best practices. In the end, it could all contribute to development of living labs.

Second, regarding the theoretical framework and the distinguishing statements, it is interesting how the empirical perspectives differ in relation to theoretical living lab characteristics. They differ in attitude towards digitalization and the digital aspect of living labs. This reveals that digitalization is a characteristic theoretically, but is not experienced as essential or promising by, for instance, the representing professional. Additionally, the experimental character is experienced a bit problematic by the online professional, but the other perspectives are neutral about it. This implies that public professionals are aware of this characteristic, but not experience it as challenging, rather, they embraced it and found a way to work with it. Regarding the local context, the results do not illustrate if or how the perspectives are dealing with the diffuse organizational boundaries. However, it appears to be that their attitude towards the local environment is somehow connected to the position of the municipality within the living lab. The distinguishing statements demonstrated that the different viewpoints of public professionals do not address all living lab characteristics in the same way. In other words, this research uncovered a bit of the gap between the theoretical characteristics of living labs and how public professionals identify their tasks and roles within the living lab empirically. The theoretical characteristics can still be used for recognizing and defining living labs in general, but should be applied carefully when the characteristics are used to study living labs on micro level.

Third, the possible roles and tasks of public professionals described in the theoretical framework serve as descriptive elements for the perspectives in this research. The public professionals' perspective can be described by referring to enabling, motivating, coordinating, facilitating and translating roles or tasks. As an example, the representing professional focusses on coordinating tasks when representing the municipality, but also plays a enabling role by knowing the expertise of all participants. However, the perspectives cannot only be understood in the existing roles and tasks, but reveal a more comprehensive understanding on why public professionals identify certain roles and tasks. The perspectives also indicate attitudes and motives of the professional. For instance, the participating professional is positive about

digitalization and its opportunities, because it advances to reach citizens and empower them to participate. Here, the professionals' role is not only described by being a motivator, but also reveals the professionals' motive to act like one and why he or she has a positive attitude towards digitalization. Hence, elements of the existing roles based on co-creation and co-production theories are useful to describe the perspectives in this research, but do not capture the motives and attitudes hidden in the perspective of the professional.

5.2 Limitations and further research

There are limitations in this study. First, the results of Q-methodology are not generalizable and the three perspectives are not applicable for a larger population. Additionally, the three perspectives are not exhaustive, because the analysis takes only the Q-sorts into account from this set of respondents (Watts & Stenner, 2012). This means that there could be more possible perspectives if there were more than 18 respondents. Nevertheless, this research tried to have a respondent group as diverse as possible by reaching out to all sorts of public professionals disregarding their level of involvement in the living lab. Second, there were no interviews conducted for the development of the statements. Only the existing literature was used as inspiration and base for the statements and then revised by a field and an academic expert. Conducting interviews might have had a positive influence on the relatability of the statements. Further research could have more interviews and more respondents and should take a longer period of time to develop statements and select a group of respondents.

Following the background questions which were additionally answered by the respondent, there was only one possible connection between the demographic information and the public professionals' perspective and no connection possible between background information related to the living lab and the public professionals' perspective. This could be explained by the small sample or it could imply that there are no connections. On the other hand it might be interesting to reuse the questions when a larger group of respondents participates. In that case, it could answer the question if there are any connections or founded connections are more likely to be representative.

Additionally, it could be interesting to study the institutional context of living labs. For instance, by comparing the relation between the chosen position of the municipality and the roles and tasks of the public professional in the living lab. The position of the municipality could serve as an independent variable in comparative research. Another example is to study the participants in the living lab and how they experience the presence and performance of the municipality and / or the public professional representing it. Here, the dynamics within the

living lab will be uncovered and could lead to new, valuable insights in the interaction between living lab participants and the public professional. This research served as a starting point to uncover and better understand how public professionals identify their roles and tasks in case of living labs by studying their perspective, but new research can help to obtain more insight into the context and dynamics they work with, in order to let living labs successfully flourish.

6. References

Akhtar-Danesh, Noori, Andrea Baumann, and Lis Cordingley. Q-methodology in nursing research: a promising method for the study of subjectivity. *Western journal of nursing research* 30.6 (2008): 759-773.

Almirall, E., & Wareham, J. (2011). Living Labs: arbiters of mid-and ground-level innovation. *Technology Analysis & Strategic Management*, 23(1), 87-102.

Ballon, P., Van Hoed, M., & Schuurman, D. (2018). The effectiveness of involving users in digital innovation: Measuring the impact of living labs. *Telematics Informatics*, 35(5), 1201-1214.

Brandsen, T., & Honingh, M. (2018). Definitions of co-production and co-creation. In *Co-Production and Co-Creation* (pp. 9-17). Routledge.

Brandsen, T., Steen, T., & Verschuere, B. (2018). Co-creation and co-production in public services: Urgent issues in practice and research. In *Co-Production and Co-Creation* (pp. 3-8). Routledge

Den Haag. (n.d.). Nieuwe techniek in Living Lab Scheveningen. Retrieved on October 7, 2020 via https://www.denhaag.nl/nl/in-de-stad/wonen-en-bouwen/ontwikkelingen-in-de-stad/gebiedsontwikkeling-scheveningen-kust/nieuwe-techniek-in-living-lab-scheveningen.htm

Dezuanni, M., Foth, M., Mallan, K., & Hughes, H. (Eds.). (2017). *Digital participation through social living labs: Valuing local knowledge, enhancing engagement*. Chandos Publishing.

Dryzek, J. S., & Berejikian, J. (1993). Reconstructive democratic theory. *American political science review*, 48-60.

Durose, C., Van Hulst, M., Jeffares, S., Escobar, O., Agger, A., & De Graaf, L. (2016). Five ways to make a difference: Perceptions of practitioners working in urban neighborhoods. *Public Administration Review*, *76*(4), 576-586.

Gascó, M. (2017). Living labs: Implementing open innovation in the public sector. *Government Information Quarterly*, 34(1), 90-98

Hossain, M., Leminen, S., & Westerlund, M. (2019). A systematic review of living lab literature. *Journal of cleaner production*, *213*, 976-988.

Jaspers, S., & Steen, T. (2019). Realizing public values: enhancement or obstruction? Exploring value tensions and coping strategies in the co-production of social care. *Public Management Review*, 21(4), 606-627.

Jedeloo, S., & Van Staa, A. (2009). Q-methodologie, een werkelijke mix van kwalitatief en kwantitatief onderzoek? *KWALON* 14 (2), 5-15.

Kronsell, A., & Mukhtar-Landgren, D. (2018). Experimental governance: The role of municipalities in urban living labs. *European planning studies*, *26*(5), 988-1007.

Lember, V. (2018). The increasing role of digital technologies in co-production. In *Co-Production and Co-Creation* (pp. 115-127). Routledge.

Maas, T., J. van den Broek & J. Deuten. (2017). *Living labs in Nederland - Van open testfaciliteit tot levend lab*. Den Haag, Rathenau Instituut.

McMullin, C. (2020). The Role of Public Servants in Supporting Local Community Projects: Citizen-Led Co-production in Quebec. *The Palgrave Handbook of the Public Servant*, 1-16.

Mortensen, N. M., Brix, J., & Krogstrup, H. K. (2020). Reshaping the Hybrid Role of Public Servants: Identifying the Opportunity Space for Co-production and the Enabling Skills Required by Professional Co-producers. *The Palgrave Handbook of the Public Servant*, 1-17.

Schmolck, P. (2014). PQMethod (version 2.35). Retrieved via http://schmolck.org/qmethod/

Steen, T., & Tuurnas, S. (2018). The roles of the professional in co-production and co-creation processes. *Co-production and co-creation*, 80.

Torfing, J., Sørensen, E., & Røiseland, A. (2019). Transforming the public sector into an arena for co-creation: Barriers, drivers, benefits, and ways forward. *Administration & Society*, 51(5), 795-825.

Tuurnas, S. (2015). Learning to co-produce? The perspective of public service professionals. *International Journal of Public Sector Management*.

van de Grift, E., Cuppen, E., & Spruit, S. (2020). Co-creation, control or compliance? How Dutch community engagement professionals view their work. *Energy Research & Social Science*, *60*, 101323.

van Eijk, C. (2017). *Engagement of citizens and public professionals in the co-production of public services.*

Van Exel, J., & De Graaf, G. (2005). Q methodology: A sneak preview. Job van Exel.

van Gestel, N., Kuiper, M., & Hendrikx, W. (2019). Changed Roles and Strategies of Professionals in the (co) Production of Public Services. *Administrative Sciences*, 9(3), 59

Vanleene, D., J. Voets & B. Verschuere (2017). Een buurt van burgers? Coproductie in de Rabotwijk te Gent. *Vlaams Tijdschrift voor Overheidsmanagement*, 4: 55-70.

Vervloed, J., van der Ent, M., Langius, J. & de Vries, S. (2019). De Haagse Labs voor 'Health Innovation'. Retrieved on October 7, 2020 via https://www.dehaagsehogeschool.nl/docs/default-source/documenten-onderzoek/onderzoeksthema's/de-haagse-labs-voor-health-innovation-2019-1-(003).pdf?sfvrsn=487746b9_2

Voorberg, W. H., Bekkers, V. J., & Tummers, L. G. (2015). A systematic review of co-creation and co-production: Embarking on the social innovation journey. *Public Management Review*, *17*(9), 1333-1357.

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method & interpretation*. Sage.

Watts, S., & Stenner, P. (2005). Doing Q methodology: theory, method and interpretation. *Qualitative research in psychology*, 2(1), 67-91.