Valuables of *NewEarth*

From reality

to games

and the way back.

Estefanía Morás Jiménez
Master Thesis Industrial Design Engineering

University of Twente
March 10, 2023
DPM 2002

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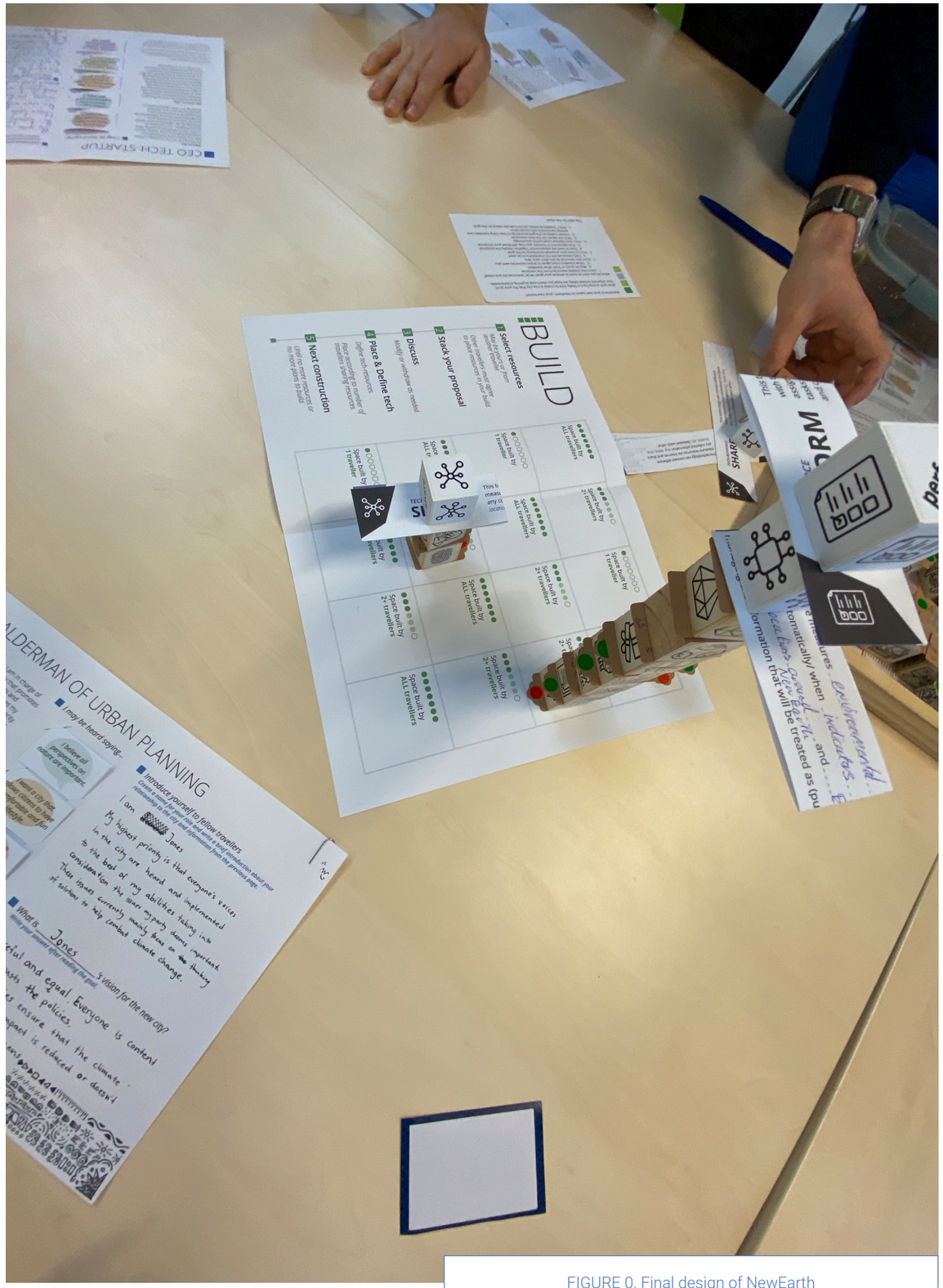

FIGURE 0. Final design of NewEarth

0. Abstract

The way academic disciplines collaborate across fields has had a long evolution. Each collaboration approach presents their own challenges and opportunities when it comes to reaching an understanding among those involved. Transdisciplinary research, a more socially responsible way of doing science, needs to incorporate the perspectives of academic and non-academic stakeholders into framing the complex societal challenge addressed. A discussion of values and worldviews can benefit the research process in its initial stages as different stakeholders come together to collaborate. ***Smart city*** collaborations, addressing urban challenges through smart technology, are used as a case study to understand in which way the multitude of stakeholder perspectives frame the collaboration. Through research into theory and practice, the serious game ***NewEarth*** (Figure 0) is designed to support the value discussion between different stakeholders. NewEarth focuses on supporting a collaborative process to design a fictional smart city informed by the values and worldviews of every player. In their roles, players embark on a journey, towards a new planet, to build a city where they want to live that addresses an environmental urban challenge. In NewEarth players discover and negotiate their belief systems in four game phases. Phases include **packing** open-ended resources; **discovering** smart technologies; negotiating to decide which resources to **discard**; and **building** their new smart city under certain limitations. This serious game, promoting relational learning outcomes, can contribute to exploring complex societal challenges addressed by transdisciplinary research. NewEarth can mediate a productive discussion of smart city technologies that pays attention to the interconnected multitude of values and the mediating role of language. The design outcome of this thesis promotes an alternative way of communication between scientific and societal practice.

Churchill famously observed,

“First we shape our dwellings and then our dwellings start to shape us.”

0. Designer’s value

One of the theoretical commitments from Value sensitive design that this thesis aligns to is: making explicit the values held by the designer. To do so, one of the designed components in this thesis is used as a basis.

DESIGNER

About me

The thesis you are about to read came to be after years of a personal interest on collaboration in the design process with ‘non-designers’. Because knowing how to follow a design process, does not mean knowing everything.

This personal approach to the design practice has only been heightened as a Master student. Especially by learning about the possibilities and vastness of the design field from the lens of another culture and ways of teaching.

Experiencing six months of discovering new fields of research every day was a truly unique experience for someone who enjoys learning; and an inspiring process right before starting this thesis.

My future city

As this thesis was starting I was able to go back to my home country after 2 years living in a very different context. To my surprise, cities had been growing in almost the opposite way to where I had been living. Almost everyone had doubled their commuting times, and those trying to cycle had to put their lives at risk. Unfortunately, no one had a say in how their hometown has been ‘developing’.

Participatory urban planning is not impossible, but it is challenging. So, why not design for it even in another context?

I may be heard saying...

Everybody can work for a better world when they can prosper in life.

I consider myself to be a citizen of the world.

I believe nature is valuable even if it isn't for humans benefit.

I want a city that allows citizens to have a diverse and expressive lifestyle.

I think nature is fragile and in a delicate balance, easily destroyed by humans.

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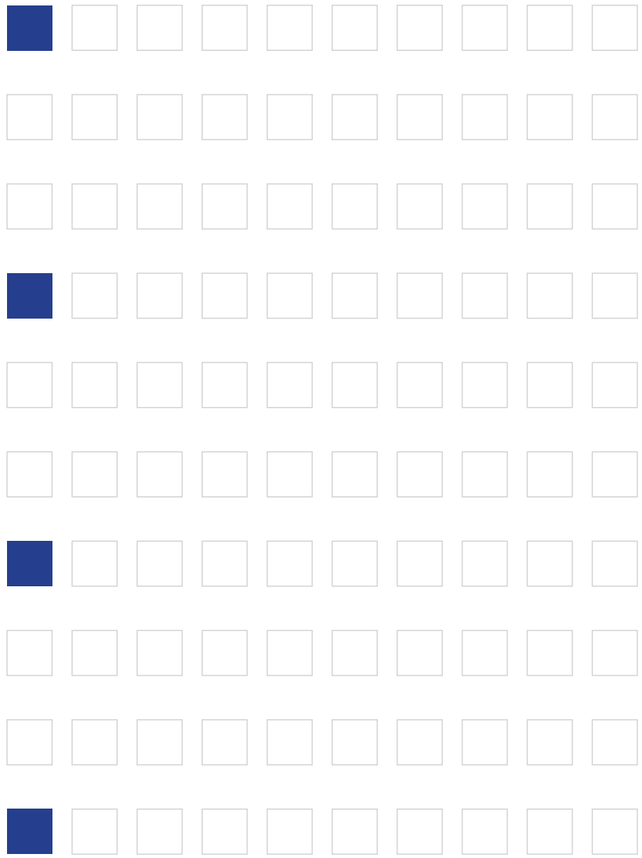
1 INTRODUCTION



The following chapter presents the starting point of this thesis project focused on multi-stakeholder collaborations, their initial research framing, and emerging value tensions. These are analysed in the context of smart cities. First, an introduction to the background of this project and its theoretical approach is given. Second, the guiding research questions (RQs) are presented. Third, the approach towards answering these is introduced. Finally, an overview of this thesis project in regards to the structure of this report is presented.

1.1 Addressing complex societal challenges

The way academic disciplines collaborate across fields has had a long evolution. Each collaboration approach presents their own challenges and opportunities when it comes to reaching an understanding among those involved. Communication obstacles have been identified in interdisciplinary collaborations in relation to differences in language, diverse individual perspectives, and different values (Ju et al., 2016). Collaborating with more distant disciplines (e.g. hard and social sciences), unveils disciplinary, cultural and contextual differences (Camara & Abdelnour-Nocéra, 2010). Extending the collaboration process beyond the academic sphere brings additional challenges. This is for example illustrated in the field of design, where Participatory Design (PD) brings end users into the design process, with varying degrees of participation, to enrich the design of the solution with their first hand knowledge (Simonsen & Robertson, 2012). Translating PD to other contexts has confronted designers with the challenge of collaborating with culturally diverse users and evolving cultural backgrounds (Hakken & Maté, 2014). Thus emphasising communication barriers between designers and users. Further broadening collaboration to include stakeholders from both academic and non-academic backgrounds has been addressed by **transdisciplinary (TD) research.** This approach transcends disciplinary boundaries to address highly intricate challenges by both the scientific and societal sphere on an equal footing (Ozkaramanli et al., 2022). Some of the complex societal challenges addressed by TD collaborations include water scarcity, climate change and rapid urbanisations (Lang et al., 2012). TD research involves a wider stakeholder network which increases the importance of addressing communication barriers. This requires, among other aspects, developing a common language and a shared understanding of the challenge (Lang et al., 2012). Thus, addressing complex societal challenges can benefit from Systemic Design. This approach allows to gain a broader understanding of the system, frame the problem space and identify the diversity of perspectives involved (Bijl-Brouwer, 2019).

In the past years, European cities have been addressing urban and environmental challenges through smart city initiatives. **Smart cities** consider the implementation of smart technologies at an urban scale to tackle sustainability challenges in benefit of the city's residents (European Commission, n.d.). In the Netherlands different efforts have been made to achieve this digital transition in Dutch cities by enabling the collaboration between researchers, residents and multiple businesses sectors (Agenda Stad, n.d.; Digitale Steden Agenda, n.d.). However, addressing such complex topics requires a systemic approach to understand the different interacting elements comprising the sociotechnical system, and to further frame the problem that will be addressed. Moreover, implementing smart technologies in the urban environment should be supported by addressing the values of its citizens.

Having non-academic stakeholders involved, such as citizens, in the design process has started to open the space for them to discuss the values attributed to the designed solutions that will ultimately affect their lives (Iversen et al., 2010; Simonsen & Robertson, 2012). The growing interest in designing solutions while being critically aware of the values being promoted has led to the development of methodologies and toolkits, such as those from **value sensitive design (VSD)** (Friedman & Hendry, 2019). VSD enables designers and researchers to systematically address values during the design process of technological solutions. Thus, addressing stakeholders' values can both nurture the design process and its outcome.

In recent TD research, addressing the values held among the research team has been proposed as

an important preliminary step ahead of starting the TD research process itself. Horcea-Milcu et al. (2022) have highlighted the importance of coherent shared values, beliefs and norms as enablers of co-creation in this preliminary stage. Intervening a system through technology has an influence in humanity's surroundings in the short and long term, and therefore attention should be paid to human values and its tensions (Friedman & Hendry, 2019). **Dilemma Thinking** can further nurture this research by productively delving into differences in values, at different levels, which allows stakeholders to analyse global issues from different perspectives (Matos Castaño et al., 2017). Emerging conflict is natural and necessary in collaborative working. Thus, embracing opposing viewpoints offers the potential to further explore the challenge at hand and its opportunities (Andersen & Mosleh, 2021).

Furthermore, the usage of **tangible representations** can help support value discussions by contributing to the creation of a shared understanding (van Dijk et al., 2014). As part of a participatory sensemaking process, tangible representations become the medium enabling stakeholders to gain insight and to communicate among them, the representation becomes a scaffold for sense making (Jaasma et al., 2017). These tangible artefacts allow stakeholders to express and examine the various perspectives surrounding the collaboration (Andersen & Mosleh, 2021), and the complexity of the societal challenge (Matos Castaño et al., 2017). These representations may be in the form of a toolkit, workshop, digital platform, physical tokens, serious games, models, among others.

The importance and benefits of considering values when designing technological solutions in such complex contexts as smart cities has led to this thesis. A theoretical approach through Systemic Design and Dilemma Thinking can contribute to the discussion of implicit values to inform a value-sensitive reframing process in smart city collaborations. Moreover, a tangible representation can act as the mediator of this discussion.

Informed by the aforementioned theory and the analysis of current practice, a **serious game** was selected as the representation to be designed. Multiplayer role-playing games have been identified as contributing to gaining an understanding of others' perspectives (Bakhanova et al., 2020). Furthering the systemic approach, **Triadic Game Design (TDG)** allows to translate a real life system into a playing experience that considers the learning aspects (Harteveld, 2011). Following this approach resulted in the serious game **NewEarth**. In this game stakeholders can express their worldviews and negotiate their values, through fictional roles, as they work together to create a smart city they want to live in.

The technological advancements for smart cities mediate a constantly evolving relationship between society and the built city (Willis et al., 2020). The complexity of the sociotechnical system and the multidisciplinary approach can benefit from value discussions. Thus, it is necessary to work towards a shared vision of the future smart city and discuss the values influencing this transition. The research presented in this thesis contributes to achieving a shared understanding in multi-stakeholder collaborations through the serious game *NewEarth*.

1.2 Research questions

Due to the aforementioned multi-stakeholder nature of smart city collaborations in the Netherlands and the challenge of achieving a shared understanding, the collaboration can be nurtured by a productive discussion of values scaffolded by a tangible representation. The process towards designing this collaboration tool will be the goal of this thesis, the main RQ capturing this goal is defined as:

RQ. How can Systemic Design and Dilemma Thinking support a value-sensitive (re) framing process within a smart city multi-stakeholder collaboration through a tangible representation?

In order to address the main research question two lenses of research will be taken: *theoretical and practical.* The theoretical lens will analyse the existent theory for framing processes and value tensions. The practical lens will focus on understanding how current practice frames their collaborations and how they address value tensions. For both lenses, the tools explored and used to support value discussions. Given the two lenses used, a subset of questions is established for each.

The sub questions for the *theoretical lens* are as follows:

- **(RQ.T1)** How can value sensitive design inform the (re)framing process among stakeholders in smart city collaborations?
- **(RQ.T2)** How can Systemic Design and Dilemma Thinking support the discussion of implicit values present in smart city collaborations?
- **(RQ.T3)** How can the discussion of implicit values be supported by a tangible representation?

The complementary sub questions for *practical lens* are as follows:

- **(RQ.P1)** How is the framing process of the collaboration occurring in the current practice?
- **(RQ.P2)** How are conflicting values currently addressed during a(re)framing process?
- **(RQ.P3)** Are there tools/methods currently used to support the discussion of values? If so, why are these chosen?

The final outcome of this thesis aims to contribute to the catalogue of tools developed for transdisciplinary research and citizen participation through a productive discussion of values.

1.3 Research approach

An overview of the methodology followed is described below in Table 1 and further translated into the project timeline in Figure 1.

Phase	*Method*	*Method Goal*	*Activity*
Research	Theoretical lens: Literature research	Gain insight into the latest research of the different topics.	Analyse publications regarding: ▪ Multi-stakeholder collaboration ▪ Design framing ▪ Values, dilemmas and controversies ▪ Tangible representations
	Practical lens: Semi-structured interviews	Gain insight from current practice of multi-stakeholder projects.	▪ Conduct semi-structured interviews ▪ Analyse data through a reflexive thematic analysis
Ideation	Theoretical lens: Literature research	Gain insight into existent/ conceptualised tangible representations within value discussions.	Delve in publications regarding the type of tangible representation.
	Brainstorming	Explore the design space through an iterative approach.	Create design concepts informed by theory and practice insights.
Testing	Workshop	Receive input from players/ practitioners.	Conduct and analyse pilot sessions.

TABLE 1. Overview of research approach to address RQs through two lenses, theoretical and practical.

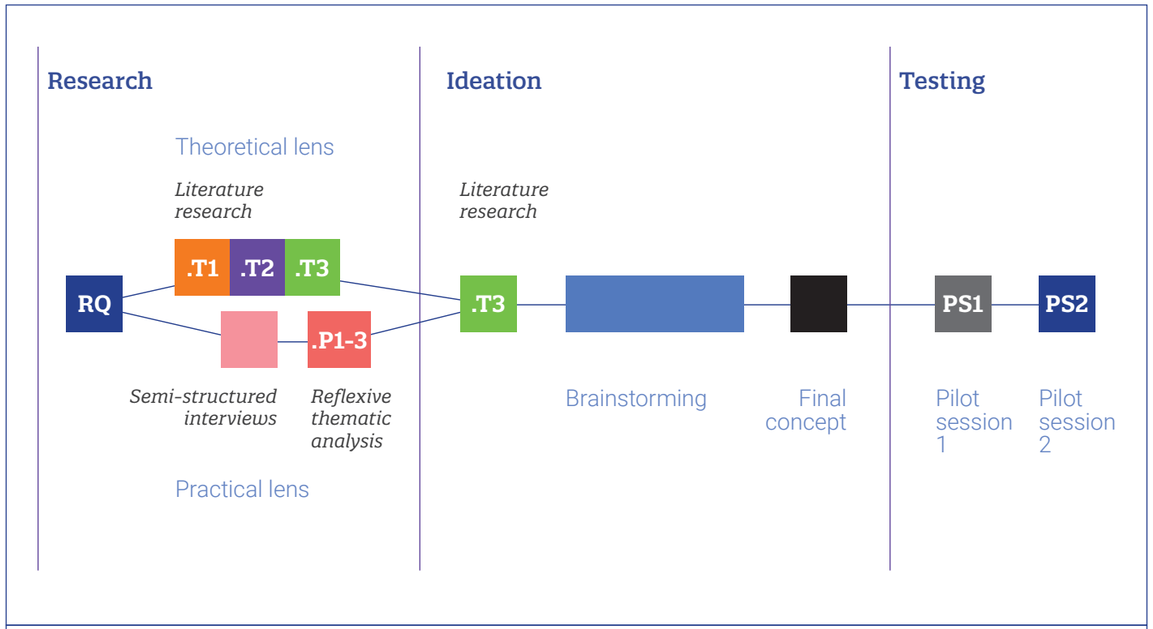


FIGURE 1. Visualisation of project timeline in regards to the methodology followed.

1.4 Thesis overview

This dissertation starts by delving into scientific literature to start addressing the RQ from a theoretical basis. Three separate but interconnected lines of inquiry were conducted that follow from a conceptual map, which is described in Chapter 2. Further, to gain a practice-informed understanding of the RQ, practitioners involved in smart city multi-stakeholder collaborations in the Netherlands are interviewed. The interview approach and a reflexive thematic analysis (Braun & Clarke, 2006) are presented in Chapter 3. Based on the findings from theory and practice, Chapter 4 presents a second literature review, which further frames the design space of this thesis; serious games. Chapter 5 covers the initial concepts, a chosen refined concept, and a playtest session. Chapter 6 presents the final game design of *NewEarth* and the theoretical basis for every component. The final design is playtested to evaluate gameplay and game goals in Chapter 7. This thesis ends with a discussion in Chapter 8 and conclusions in Chapter 9.
The design process resulted in *NewEarth*, a multiplayer serious game that approaches the design of smart cities by embracing the multitude of worldviews and productively engaging in controversies.

2 THEORETICAL LENS

PART 1

The following chapter presents the *literature research* to address the research sub questions from the theoretical lens. First, the approach to literature is presented along with the three interconnected lines of inquiry through a conceptual map. Second, smart city collaborations in the Netherlands are introduced as the context of this thesis. Third, the literature informing this thesis is presented in regards to each line of inquiry identified from the conceptual map. The three lines of inquiry are (1) addressing complex societal challenges, (2) values in the design process, and (3) tangible representations for a shared understanding.

2.1 Literature approach

To gain an understanding of the academic research relevant for this thesis, it was planned to analyse scientific literature that contributes to address the sub questions of the theoretical lens. This method contributes to identifying the latest efforts made by researchers in the different areas of this thesis and relevant related work in which their research is based on.

To address the theoretical sub questions (Chapter 1), the main topics were used as the starting point for literature research: smart cities, framing in design practice, values and dilemmas, and multi-stakeholder collaboration tools. Literature was selected by reviewing abstracts that presented a possible contribution to the RQ and further complemented by reviewing their references lists that delve specifically in said topics. By gaining a further understanding of the topics, the context of smart cities was framed and the other three lines of inquiry started to connect to each other. These connections were identified by reviewing publications from different fields. It was found that multiple researchers are working to allow a group of individuals to reach an understanding of complex multi-layered topics; such as smart cities. To display these connections, which have influenced this thesis, a **conceptual map** was created displaying the ***three interconnected lines of inquiry.*** The theoretical conceptual map (Figure 2) reflects the connections made during literature research.

■ First, shown in orange, multi-stakeholders collaborations can benefit from taking a systemic design perspective to frame complex societal challenges and the values found among the stakeholders. ■ Second, shown in purple, making values explicit to identify tensions can open value negotiations that further inform the understanding of the challenge and possible interventions. ■ Third, in green, tangible representations have the potential to scaffold value and systemic discussions to discover the multitude of perspectives on the challenge at hand.

The research presented in the following sections covers the literature that informs the final result of this thesis. ■ First, the context of smart cities is presented, and then followed by a section for each of the three lines of inquiry.

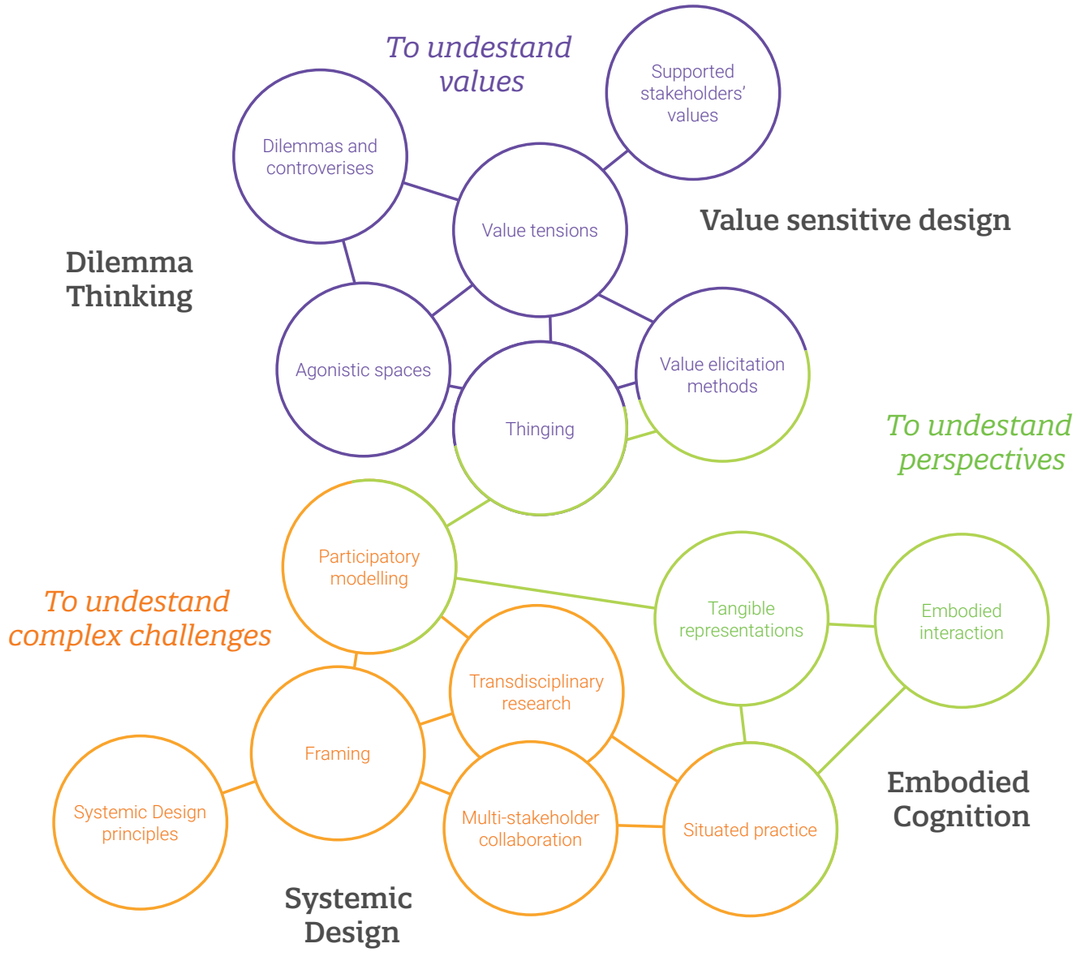


FIGURE 2. Theoretical conceptual map displaying three interconnected of lines of inquiry guiding the literature research. First, shown in orange, multi-stakeholders collaborations can benefit from taking a systemic design perspective to frame complex societal challenges and the values found among the stakeholders. Second, shown in purple, making values explicit to identify tensions can open value negotiations that further inform the understanding of the challenge and possible interventions. Third, in green, tangible representations have the potential to scaffold value and systemic discussions to discover the multitude of perspectives on the challenge at hand.

2.2 Smart city collaborations

The smart city

According to the European Commission (n.d.), smart cities are those "using technological solutions to improve the management and efficiency of the urban environment" for the benefit of its citizens and commercial sector. The term has been used across commercial, urban and academic fields to refer to cities with technology embedded in the form of monitoring devices and the platforms that allow data processing at a large scale and close to real-time (Willis et al., 2020). The definition of a smart city has been the subject of debate and approached from different angles to clarify the 'smartness' of the approach or whether other terms would be more appropriate (e.g. connected city). Hollands (2008) has categorised the term as used in three different paths: the infrastructure network for economic, politic, social, cultural and urban development; for business and entrepreneurship development; and to support the social and sustainability agendas. The latter approach is the one guiding this thesis by focusing on the relationship between the city, the citizens and the mediating technology. This view has been explored by Batty (2020) by recognising the impact smart technologies have on the social and economic dimensions of the city, which then transforms both, the development of the city and the behaviours of its residents. Batty continues to highlight how these transformations can happen at different time intervals (from seconds to centuries) as the acceptance and appropriateness of certain technologies changes the 'smart city'. The focus on people-first emphasises the ethical issues present in smart cities, such as forcing the citizen to become part of the digital network, given that many of these do not require nor allow the user to have control over what data is collected (Eckhoff & Wagner, 2018).

The vast array of technologies that have been proposed for smart cities or already deployed can be arranged in different taxonomies whether by application or by technology, encompassing both hardware and software (Batty, 2020; Eckhoff & Wagner, 2018). Given the scope of this thesis only three categories will be further discussed, these encompass multiple application opportunities instead of specific solutions. Furthermore, this selection allows a focused discussion when using the final design outcome through a manageable amount of technical information.

- **Sensors:** refers to knowledge collectors, these fixed sensors can record events automatically or activated by human touch such as pollution monitors or payment terminals; other sensors function as transmitters of data which can collect bigger datasets whether activated from our own interaction with them or from passive functions such as those identifying a smartphone nearby (Batty, 2020; Eckhoff & Wagner, 2018).
- **Autonomous systems:** hardware equipped to recognise its environment and operate with varying degrees of human intervention such as robots, drones or vehicles; the purpose may include delivery of goods, cleaning services, surveillance, transporting people, among others (Eckhoff & Wagner, 2018; Vigo, 2022).
- **Internet of Things:** infrastructure which allows physical and virtual smart components to be connected via the internet, such as smart home appliances; serves as an extension of other technologies to improve operation by collecting grand amounts of data (Eckhoff & Wagner, 2018; Merriam-Webster, n.d.).

The market of smart technologies will only continue to grow and increase in complexity, thus understanding them is necessary to decide when and how to implement them in our cities. However the implementation of smart technologies does not necessarily lead to an improvement of the city's experience, since it can not be expected from technology to automatically transform cities instead of focusing first on the people (van Waart et al., 2016).

Smart city collaborations in the Netherlands

Multiple programmes, research efforts and collaborations have taken place in the Netherlands to address environmental and sustainability challenges through smart city technologies. Many of these have taken a participatory approach, involving municipalities, research institutions, private parties and citizens (Agenda Stad, n.d.; Digitale Steden Agenda, n.d.). Some of the recent initiatives are part of 'City Deals' which focus on urban issues present in Dutch cities (Agenda Stad, n.d.). 'A smart city, that's how you do it' is one of the City Deals in progress, with 63 participating partners, focused on changing current smart city design processes by focusing on safeguarding democratic values (Wesselink, n.d.).

Projects addressing the implementation of smart technologies around the city are also found in organisation initiatives such as the project portfolios from the Amsterdam Institute for Advanced Metropolitan Solutions (AMS), projects fostered by Waag Futurelab, and the digital platform 'Amsterdam Smart City'. In the case of the AMS Institute (n.d.), their interdisciplinary research-based approach focuses on addressing urban challenges such as smart urban mobility, climate resilience, circularity, responsible urban digitisation, among others. They test, develop and co-create solutions with both public & private partners and citizens through their living labs, these are spaces for co-creating solutions with different stakeholders for a later validation and implementation in real life settings. In Waag Futurelab (Waag, n.d.), they aim to contribute to the research, design and development of a sustainable and just society through a transdisciplinary approach to researching emerging technologies and designing alternatives on the basis of public values. Further efforts fostering collaboration are those collected and initiated via the digital platform 'Amsterdam Smart City'. This initiative facilitates partners and communities to innovate and collaborate for urban innovation on shared grand challenges such as circular city, energy, mobility, citizens & living, and digital city which are further divided into more specific topics (Amsterdam Smart City, n.d.). The open and safe platform is welcoming of any individual or organisation interested in and working on the urban challenges of the Amsterdam Metropolitan Area in the formats of research projects, events, masterclasses, sharing news, calls to collaborate or vacancies in the field.

The current efforts in the Netherlands have defined broad challenges to be addressed through smart technologies. These collaborations are multidisciplinary and involve non-academic stakeholders in different degrees of participation, from core partners to funding providers. The different organisations emphasise on collaborating with citizens by collecting knowledge from them, mainly in the form of co-creating solutions or providing feedback on designed solutions. To delimit the discussion supported by the design outcome, three challenges are defined as the context to discuss the implementation of the aforementioned smart technologies: accessible mobility, reduced energy consumption, and climate resilient cities.

2.3 Addressing complex societal challenges

Transdisciplinary research

Being complex and non-addressable through traditional approaches are some of the characteristics defining 'wicked' challenges such as climate change. These are considered as highly intricate given that 'solving' them has no definitive solution since any attempt would cause new issues (Bernstein, 2015). Transdisciplinary (TD) research offers a way to approach these challenges by considering the involvement of

researchers from different fields along with actors external to academia. The diversity of backgrounds allows the research team to collect valuable input and essential knowledge related to the challenge at hand (Lang et al., 2012). For these reasons, TD research is well suited to target complex societal challenges that transcend the boundaries of disciplines, opening up a space for academic and non-academic actors to collaborate on an equal footing, leading to a more socially responsible practice (Ozkaramanli et al., 2022).

The ideal conceptual model of a TD research process (Lang et al., 2012) is proposed as comprising three sequenced phases covering from team building up to knowledge reintegration (Figure 3). Given the scope of this thesis the main area of focus is ***Phase A*** as it is in this phase where the challenge is framed and the collaboration team comes together. Within this phase Lang et al. (2012) recommend enabling the team to create a 'common language' that includes terms playing a central role, and/or terms open to multiple interpretations based on the members' backgrounds, and further complemented by a shared understanding of relevant concepts in the research process. The authors further emphasise that, working towards achieving a shared language, is a collective effort to prevent misunderstandings that might hinder the collaboration further in the process. Pschetz et al. (2022) identified that the terminology used among stakeholders can change how the topic is understood or framed, thus transforming language into a shared and evolving aspect of the collaboration.

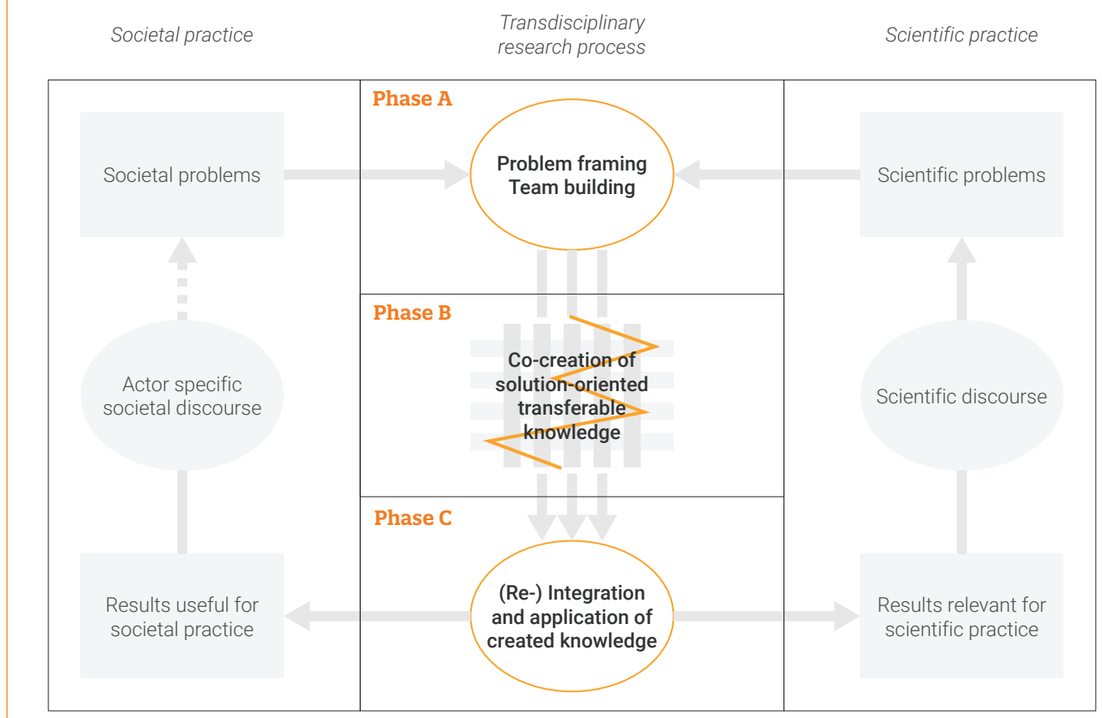


FIGURE 3. The ideal conceptual model adapted from Lang et al. (2012). The model starts with Phase A which considers the collaborative process of framing the problem and building a collaborative research team. Phase B focuses on the co-production of solutions and transferable knowledge. Lastly, Phase C addresses the integration and application of produced knowledge within both scientific and societal practices.

TD research has recently been expanded to consider a preliminary phase of the aforementioned model focused on setting up the collaboration; ***Phase 0*** (Figure 4). This phase emerges from the recognition that oftentimes TD research starts from a specific case study which does not exist in isolation (Horcea-Milcu et al., 2022). Thus, it is worth addressing how the case emerges before framing the problem in Phase A.

The sub phases added to the TD model are further complemented by cross-cutting lessons (Horcea-Milcu et al., 2022), two of which are closely related to this project. These are:

- *Managing the trade-off of togetherness:* refers to the tension between the individual and collective expectations which shape group dynamics through the perceived group gains and individual losses. In redefining boundaries between science and society, academics need to address citizens at their level to identify the diverging interests and goals.
- *Togetherness with shared values:* a sense of deeply shared values, beliefs, and norms can contribute to fostering a trusting science-practice relationship even when the ways to act on them differ within the collaboration. Regular interactions to discuss the values supporting the collaborations' goals can contribute a sense of togetherness.

Furthermore, the authors (Horcea-Milcu et al., 2022) remark these lessons differ from 'creating a joint understanding' in Phase A (Lang et al., 2012) since addressing values happens at a deeper level. However, these values and intentions subsequently influence the frame of the sustainability challenge and solution space.

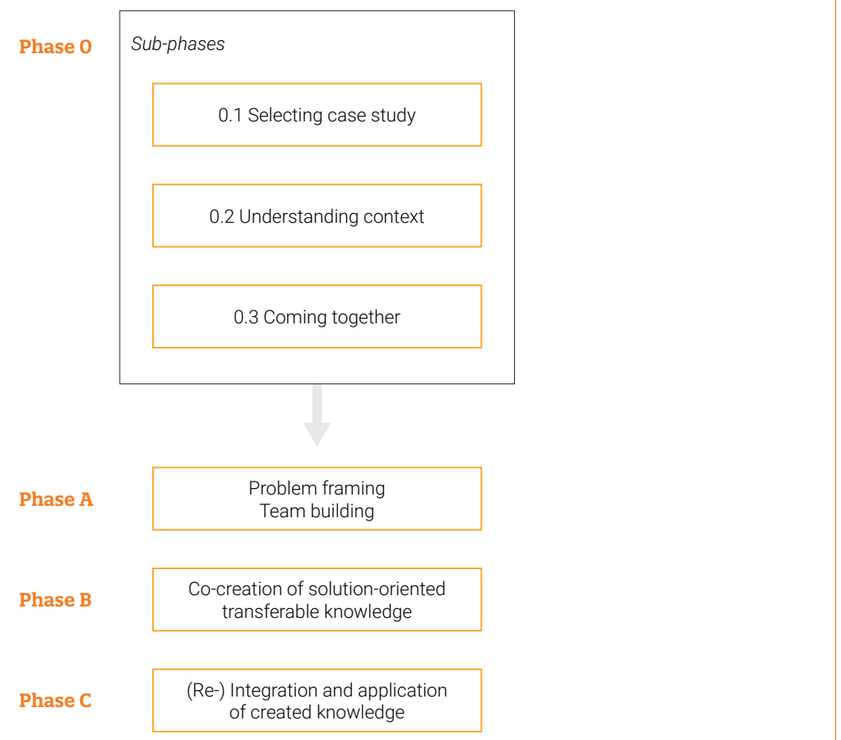


FIGURE 4. Transdisciplinary model including Phase 0, A, B and C (Adapted from Horcea-Milcu et al. (2022) and Lang et al. (2012)). Horcea-Milcu et al. (2022) propose to intentionally design for the emergence of the case study through the model for Phase 0, which includes three sub phases: (0.1) selecting the case study, (0.2) understanding the case study context, and (0.3) fostering premises for coming together.

Systemic Design

Creating a shared definition of the problem between academic and non-academic stakeholders can be explored through design practices. The field has expanded from solely designing products towards addressing wicked challenges, and from a focus on individual end users towards a focus on society as a whole (Bijl-Brouwer & Malcolm, 2020). In areas dealing with complex challenges, design practices offer the opportunity to look at the entire system, redefine the problem, delve into the user's needs, test iteratively early in the process and engage actors from different backgrounds (Bijl-Brouwer, 2019). The analytical strengths of Systems Thinking can support design's actionable approaches to address complex societal challenges, by considering them an indivisible whole connected to a larger system; thus creating the field of Systemic Design (Bijl-Brouwer & Malcolm, 2020).

Determining the problem at hand is also dependent on how the situation is defined. This practice is referred to as ***framing*** and involves the essential step of creating a set of 'rules' that coherently delimit, identify and guide the following steps in the design process (Bijl-Brouwer, 2019). Taking on an iterative framing process allows stakeholders to modify their challenge and outcome frames as they gain a wider perspective on the challenge, which can happen multiple times throughout the project, as identified by Bijl-Brouwer (2019).

Bijl-Brouwer (2019) further identified four main drivers that trigger an iteration of the problem frame in public and social innovation cases: research, solution testing, thinking tools, and principles. The drivers consider research from qualitative approaches that include the perspectives of the different stakeholders and therefore alter the understanding of the challenge. Second, evaluation and discussion of potential solutions at different stages of the project that offer insights into the suitability of the solution and problem frame. Third, the use of thinking tools such as systems maps to reflect upon the systemic implications of the problem space. Last, the principles designers carry into addressing a design problem such as beliefs, values, or systems thinking principles. Furthermore, the author recognises these drivers may be applied in different combinations depending on the research approach defined.

Moreover, systemic principles have been identified by Bijl-Brouwer & Malcolm (2020) which are applied by social innovation practitioners. These principles can complement the process of understanding complex societal challenges. The five identified principles are summarised below.

- *Opening up the problem space and acknowledging problem interrelatedness:* adopting a systemic perspective to understand the connected problems comprising the societal challenge to identify the possible perspectives from which to frame the problem space and further open new pathways in the solution space.
- *Developing empathy with the system:* exploring the problem space systematically by recognising the diverse stakeholders' perspectives, identifying relationships, and making use of emerging tensions to nurture the project.
- *Strengthening human relationships to enable learning and creativity:* creating an intervention that provides the conditions for learning and creativity behaviours to emerge within the human relationships and within the greater social system.
- *Influencing mental models to enable change:* understanding, challenging and influencing stakeholders' learned mental models to discover new opportunities. Even though they are difficult to change as we may not be consciously aware of the mental models we hold, addressing them is key for systemic transformation.
- *Adopting an evolutionary design approach:* approaching change as a series of small steps that guide the transformation in the desired direction through multiple tests and iteration of frames and prototypes.

Diverging from 'traditional design', complex societal challenges require framing practices involving systemic design principles, pursuing multiple frames, and using tools and methods adequate for the social complexity involved (Bijl-Brouwer, 2019). A systemic design approach can support TD research processes as different perspectives come to work together with diverse values. Identifying the diversity of perspectives and understandings of the challenge can support the sense of togetherness among the multidisciplinary group of stakeholders. Furthermore, reconciling knowledge from different disciplines positions researchers in new roles (Kruijf et al., 2022). Thus, offering a design opportunity within multi-stakeholder collaborations for mediating the understanding of multiple perspectives and connecting different types of knowledge.

2.4 Values in the design process

Values

Defining the concept of values, identifying categorisations and evolving value lists are practices in constant change within and beyond the design field and its participatory approaches. Considered as a challenging research topic due to their multifaceted nature (Horcea-Milcu et al., 2019), framing 'value' has created multiple definitions throughout history of both the term itself and its components (Friedman & Hendry, 2019). The diversity of disciplines defining and categorising values reflects how these frame our understanding of the world and our efforts to transform its societal systems (Horcea-Milcu et al., 2019).

Borrowing from the theory of Value Sensitive Design, 'human values' are defined in this thesis as "what is important to people in their lives, with a focus on ethics and morality". Though a debated definition for some fields, Friedman & Hendry (2019) advocate for the importance of leaving the 'what' open to allow the researcher to delve into value discovery and elicitation methods. Human values, in its abstract interpretation by Rawluk et al. (2019), can be further understood as the somewhat stable beliefs and principles held by individuals to guide their behaviours. However, values are not to be confused with social norms which may also stir individual behaviour but are mostly based on what the majority considers the right path of action (Iversen et al., 2010).

The conceptual framework by Rawluk et al. (2019) (Figure 5) draws from different theoretical concepts of 'values' and 'valuing' to support cross-disciplinary discussions within complex socio-ecological challenges. The mapping of concepts extends in two dimensions, context dependence and abstractness of values. The second axis relates the closest to this thesis since it can support the discussion and reflection of what is individually valuable. Moving left to right in this dimension can help elicit more abstract value concepts, while moving right to left can evoke the qualities and objects a person deems valuable (Rawluk et al., 2019). These discussions can be further supported by laddering interview techniques (Reynolds & Gutman, 1988).

Value Sensitive Design

Within 'traditional' design practices, the values of users and society are not considered to have a relevant impact on the design outcome, though this does not exclude designers from imposing their values on the designed result (van den Hoven et al., 2015). Value Sensitive Design (VSD) is an effort to address this situation by proactively considering values, from different perspectives, as part of the ***technology***[1] design process (Davis & Nathan, 2015). This approach aims for technological innovation that advocates for the broad spectrum of values that can emerge in humans from the early stages and throughout the design process (Friedman & Hendry, 2019).

As designers have started to consider values with a greater importance in their practice the aim has been to create technologies in closer

1. Refers to and includes tools as human-scale physical artefacts, tools which further apply scientific knowledge, and infrastructure as the organisational structures and facilities needed for the operation of a society or an enterprise; the term 'technology' considers all three of these and their interdependencies under which artefacts, buildings and policy fall under (Friedman & Hendry, 2019).

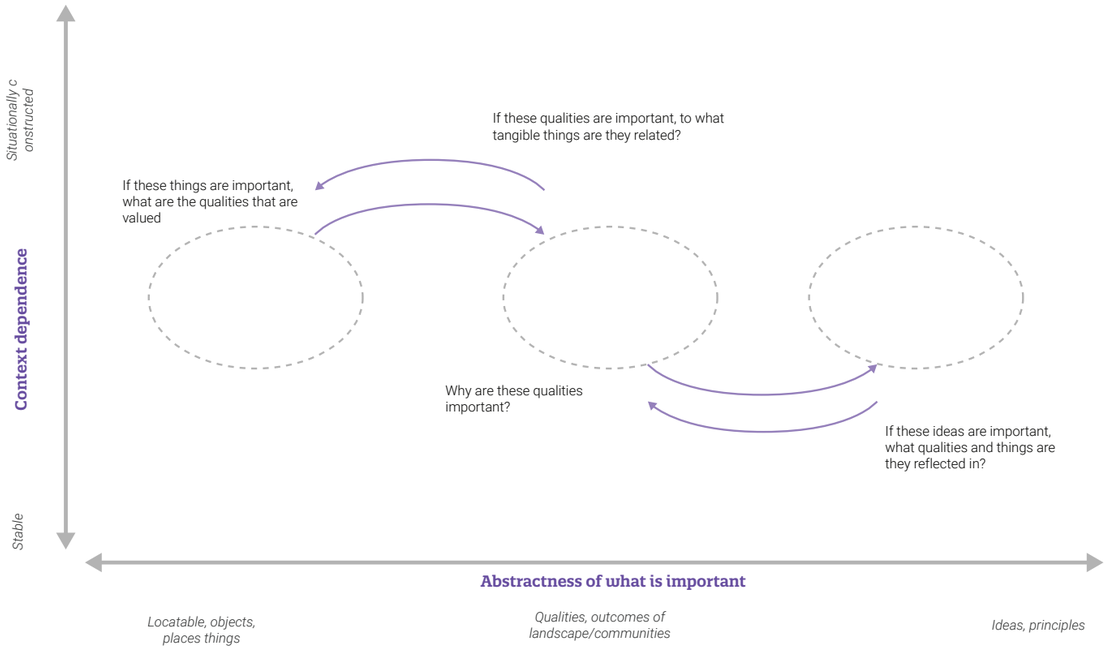


FIGURE 5. Adapted from Rawluk et al. (2019), the conceptual framework with the suggested questions to navigate across abstractness. The abstractness dimension starts, in the left, from value concepts related to tangible assets such as spaces and objects found naturally or built. The central space reflects value conceptualisations, referring to qualities and beliefs, of communities and their relationships towards other members and their space (e.g. worldviews). Lastly, on the right end, the more abstract concepts where values can be understood as ideas and principles individually held.

alignment to the values of stakeholders (van den Hoven et al., 2015). Advocates of VSD consider that identifying and advocating for human values, even in an imperfect effort, contributes to a better understanding of the technology's use and the possible unintended negative impact it may create (Davis & Nathan, 2015). An important discussion to have when designing interventions in cities using smart technologies.

From the array of theoretical commitments within VSD, those used within this thesis and its outcome are summarised below from Friedman & Hendry (2019):

- *Heuristic human values list:* though lists describing values may appear to be helpful, providing a descriptive list would further privilege some values above others and the stakeholders who feel reflected in them.
- *Beyond human values:* even though most of the technology designed is meant for humans, technology reaches far beyond and should consider other nonhuman entities such as nonhuman species, superorganisms, Earth and social robots.
- *Interactional stance:* proposes that individuals and society shape the technologies and in turn, those technologies affect human experience and societal contexts. The dynamic human-technology relationship reflects on how technology might be adopted differently by stakeholders, for different applications, and its evolution in the long term.
- *Explicitly supported values:* refers to those values being advocated for within the project either by project sponsors, design team, direct and indirect stakeholders. Making values explicit and transparent can highlight differences or similarities.
- *Value tensions:* values do not exist in isolation but rather interconnected, and affecting one has an effect on others. However, framing design processes that allow a constructive engagement with these tensions is a yet to be explored area for VSD.

Different methods have been developed to investigate values within VSD, fourteen of which are recognised as unique for this approach (Davis & Nathan, 2015); those relevant to this thesis are analysed in the last section of this chapter.

Values and the environment

From TD research two frameworks are worth delving into which focus on values at a societal level in sustainability related research. First, the four worldviews identified on the opinions and behaviours towards climate change by De Witt et al. (2016). Second, four perspectives to understand values' relationship in sustainability transformation by Horcea-Milcu et al. (2019).

Worldviews can be defined as the overarching lenses through which humans interpret, enact and co-create their reality which further influences our perceptions of global issues and their potential solutions, and thus the willingness to get involved in said proposals (De Witt et al., 2016). According to the authors' research, worldviews represent a fundamental aspect of one's identity and have the potential to contribute to the understanding of disagreements around complex challenges such as climate change; and thus making these perspectives explicit can contribute to creating a mutual understanding for the development of communications and policies. The Integrative Worldview Framework (Hedlund-de Witt & Hedlund-de Witt, 2013) recognises four different categories individuals can align towards: traditional, modern, postmodern and integrative. These worldviews are identified through sixteen sets of statements some of which are related to values of nature, the role of science, human-nature relationship, individual-society relationship, among others (De Witt et al., 2016). Being aware of worldviews surrounding the challenge within a TD project is essential for effective communication and collaboration; and a competence for designers in the field (van der Bijl-Brouwer, 2022).

Value perspectives provide different roles in which values partake in sustainable transformation, the four interrelated perspectives described by Horcea-Milcu et al. (2019) aim to encourage a more systematic consideration of how values interact and change in sustainability research. Within the scope of this thesis, two perspectives will be further described that address values in closer relation to the goal of this thesis. First, surfacing implicit values (Perspective 1) and assumptions of the researchers framing the project allow to generate knowledge that reflects the diverse value systems in both the problem framing and solution space. Second, negotiating values (Perspective 2) brought by the diverse actors can contribute to informed decision making processes that shape the collaboration and shared goals. The remaining two perspectives further expand this analysis by exploring economic valuing participatory methods (Perspective 3), and individual value transformation (Perspective 4). The four perspectives provide different depths of addressing values with no hierarchical connection between them but rather interconnected (Horcea-Milcu et al., 2019).

Both frameworks present different, but complementary, angles to understanding values within the human-nature relationship. Approaching the discussion of values from *worldviews* can contribute to identifying the value tensions among stakeholders and can support the reflection of values along Rawluk et al. 's (2019) abstractness dimension. Furthermore, tools for supporting Perspective 1 and 2 (Horcea-Milcu et al., 2019) can contribute to multi-stakeholder collaboration in its initial phases.

Dilemma thinking and controversies

In multi-stakeholder and community-based participatory projects, the multitude of perspectives can lead to dilemmas. These are contrasting or conflicting values where various options appear as mutually exclusive and (un) desirable for some (Grönvall et al., 2016; Matos Castaño et al., 2017). Engaging and untangling dilemmas offers the potential to address complex situations, promote collaboration, drive decision-making processes, and generate solutions that attend to the various, possibly conflicting, demands (Matos Castaño et al., 2017). Through a systemic lens, dilemmas can emerge between human and non-human elements that compose society and at different levels from individual to societal (Ozkaramanli, 2021). Interrelated dilemmas are also referred to as controversies. Controversies are situations of disagreement, surrounding socio-technical developments. Matos Castaño et al. (2020) have found controversies may emerge between stakeholder groups, within stakeholder groups, and within individuals in collaborative settings. These create a network of conflicts that provides insight into the multitude of perspectives which can contribute to creative thinking and ethical reflection. Smart cities can be a fruitful setting of controversies given the socio-technical implications of transforming an urban context. This entails complex interactions between technology and multiple lifestyles with the interests and values from the different stakeholders (Geenen et al., 2022).

Agonistic spaces and *thinging*

Instead of aiming for consensus, agonism embraces disagreement and its diversity of perspectives to open a passionate, but tolerant, discussion between groups. Thus transforming enemies at conflict into constructive adversaries with opposing interests that respect the other's (Björgvinsson et al., 2012). Agonistic spaces suggest the co-existence of conflicting values, which through negotiation supported by *things*[2] can create a productive approach to controversies (Grönvall et al., 2016). Therefore, *thinging* opens a design space to create agonistic spaces in multi-stakeholder projects to embrace the diversity of values. Grönvall et al. (2016) have recognised how opposing, or antagonistic, values brought by stakeholders can be negotiated through 'design things' to gradually co-exist and allow new practices to emerge. Furthermore, they recognise that value negotiation processes have to consider that the network of values is dynamic and constantly re-structured and therefore changing the central conflict that surrounds the agonistic space.

Creating interventions to address complex societal challenges needs to consider the dynamic network of values brought to the table by the different stakeholders. Designing for this process can contribute to smart city collaborations in many ways. *Things* can mediate discussions that stimulate reflection, challenge assumptions of what is given for granted, and further act as provocateur to create productive agonistic spaces (Geenen et al., 2022; Matos Castaño et al., 2020). Design practices have used tangibles to explore the multitude of perspectives and address conflicting perspectives among stakeholders. This has given the opportunity to non-academics to express their ideas within participatory collaborations (Andersen & Mosleh, 2021). Allowing people to actively participate in the design and implementation of technologies in the city, and the platforms that manage these, is a way of ensuring that their values shape how the city operates (Willis et al., 2020).

2.5 Tangible representations for a shared understanding

Embodied cognition

To approach the development of tools for TD collaborations, this project takes an embodied approach to design. In the field of HCI, a broad amount of work has been built upon principles from Embodied Cognition (EC) theory for the development of hybrid technological solutions (i.e. interactive physical-digital artefacts). These aim to make interactions more intuitive and meaningful by spreading digital phenomena over the physical world (van Dijk, 2018). Interactive artefacts have shown potential as mediators of collaborative teamwork, shifting away the focus from digital interfaces towards the physical world in a less restricted approach to the creation of shared understanding (Arias et al., 2000; Jaasma et al., 2017).

Embodied interaction

At a fundamental level, EC presents the idea that cognition does not emerge from the brain as an isolated resource for making sense of the world; it instead explains cognition as a property that is intrinsically linked to our bodies (van Dijk et al., 2014). From this perspective, human beings engage in a continuous process of perceptually guided motions, in which actions influence what we perceive and what we perceive influences the actions taken. The authors continue to explain how these couplings of action and perception enable us to make sense of the world through the interplay between the body, the environment in which it is situated, and the interactions that take place in it. In other words, the authors argue that human beings make sense of the world while interacting with and in it. Extending this to the social domain, De Jaegher & Di Paolo (2007) argue that, in social interactions, there is a "coordination of intentional activity" that influences the individual sensemaking processes involved, resulting in new participatory sensemaking processes that are not available to individuals on their own.

Situated practices and representations

Because the physical and social space in which interactions are situated greatly influence our sensemaking processes, the tools used to mediate transdisciplinary collaborations play an important role in the way in which shared understanding develops in such collaborative efforts. People improvise and adapt in function of the circumstances and opportunities that arise in situated practices, using the things available as part of their sensemaking (Suchman, 2007). Furthermore, people intersubjectively construct meaning and knowledge, in relation to their physical world and social context, which makes tangible artefacts crucial mediators in the generation of shared insights (Jaasma et al., 2017). As such, the mediating role of these artefacts is linked to the ways in which their significance arises in the setting of a concrete social context.

For this reason, in the development of tangible and embodied collaborative tools, an important area of interest has been dedicated to the role of representations. In tangible or tabletop systems for collaboration, visual information and physical objects have oftentimes been used as representations of 'results' or 'input' generated by participants, making the system just a means of storing and exchanging information to trigger collaboration (Jaasma et al., 2017). However, because of the role that the presence and manipulation of physical tools can take in mediating the way in which people deal with each other in a situated practice (van Dijk et al., 2014; van Dijk & Hummels, 2017). Thus, tangible representations can be used as direct mediators to engage with others during collaborative work.

Tangibles for...

Multiple tangible representations have been identified through this literature research. These eleven representations can be found in different formats and for diverse purposes. This selection is presented as tangibles for (1) societal challenges, (2) systemic representation, (3) value elicitation and negotiation, and (4) those that fall under all these categories. These divisions are for clarity of this review even though some may contain characteristics from other categories. The analysed tangibles are shown in Figure 6 and individually described in Appendix A.

2. In Nordic and Germanic societies, things were assemblies, rituals and spaces to address disputes and make political decisions; from Latour's (2005) perspective things can be considered as collectives of humans and non-humans where to address controversies (Björgvinsson et al., 2012).

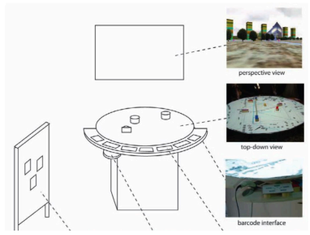
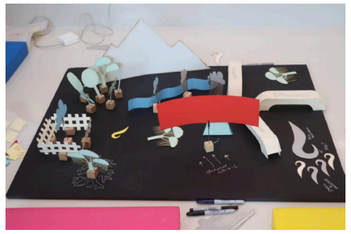
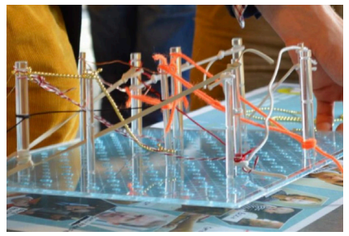
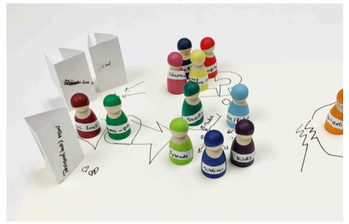
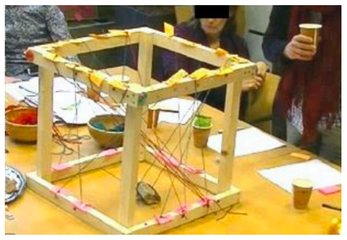
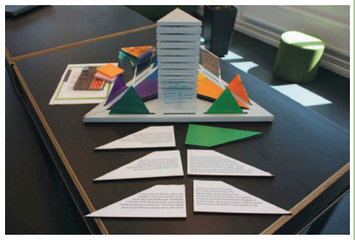
Tangibles for societal challenges		
[X]Changing Perspectives (Jaasma et al., 2017) 	MR-Tent (Bratteteig & Wagner, 2012) 	Envisionment and Discovery Collaboratory (Arias et al., 2000) 
Tangibles for systemic representation		
Material Landscape Kit (Lockton et al.) 	Multi-sensory mapping tool (Aguirre-Ulloa & Paulsen, 2017) 	----
Tangibles for value elicitation and negotiation		
Value scenarios (Friedman & Hendry, 2019) 	Stakeholder tokens (Yoo, 2017) 	Voicing values (Leong & Robertson, 2016) 
Tangibles for all of the above		
The Dilemma Cube (Matos Castaño et al., 2017) 	The Moral design game (van der Vorst, 2022) 	3P (Andersen & Mosleh, 2021) 

FIGURE 6. Visualisation of the eleven tangibles arranged according to four categories for clarity of analysis. Presented as tangibles for (1) societal challenges, (2) systemic representation, (3) value elicitation and negotiation, and (4) those that fall under all these categories. Images adapted from their corresponding publications.

Some of the selected tangibles support discussions regarding societal challenges among academic and non-academic participants; others focus on bridging disciplines or specific technologies. For those focused on the systemic perspective, the activities involve mapping the system by identifying its elements and their connections; which support the discussion of recognising the multitude of perspectives. In the case of discussing values some of them opt for having specific values guiding the discussion, and others aim for discovering values to further list them. These characteristics are not mutually exclusive, but rather prioritised over others in the different tangibles. As for those categorised as possessing all characteristics, they further address values in the form of dilemmas by exploring the different perspectives among academic and non-academic stakeholders. Designing for this last category will be the aim of this thesis as it aligns with the aforementioned approach of addressing values as tensions rather than lists.

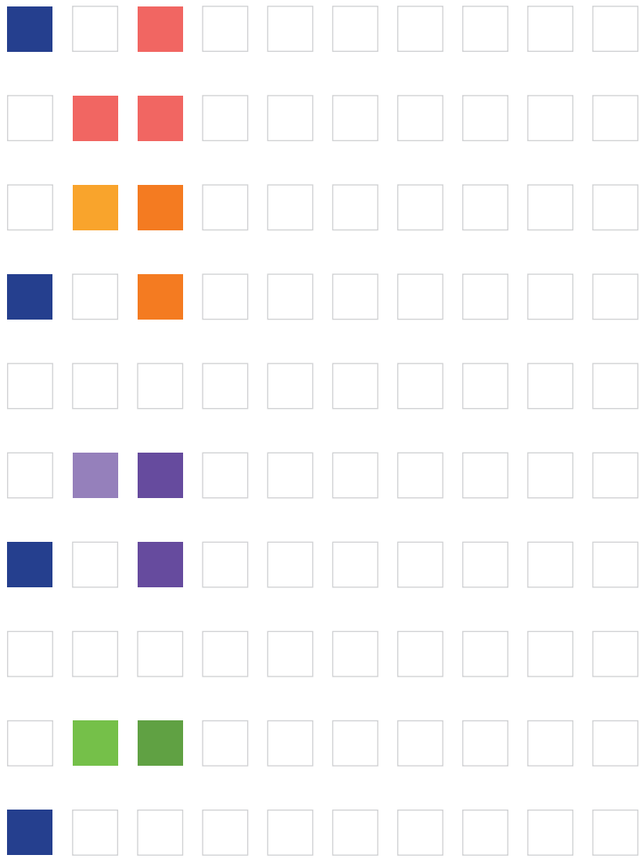
Furthermore, tangibles can be identified as physical and hybrid. Physical designs capture the participants' attention by interacting and re-arranging materials such as tokens, threads, boards, and materials for writing. Hybrid representations make use of the room by introducing a table-like surface with elements to interact with, re-arranging these physical elements is then reflected on screens. Both formats allow participants to represent their personal input to the discussion.

Seven of the presented tangibles allow the participants to interpret the physical elements presented. The openness for interpretation is found in the meaning of icons, textures, shapes, and sizes. The meaning of these elements can be defined individually or as a group depending on the design. Moreover, these may be defined as discussion starters or as participants work together during the session. Thus, these undefined elements become a representation of their shared insights (Jaasma et al., 2017).

From the remaining four tangibles, two make use of more accurate representations of the real life context. This is found in the form of city maps and tokens symbolising specific city elements (e.g. cars). The participants can use these representations to support their process of understanding the case study directly in its context and exploring possible interventions. The last two tangibles require the participant to focus on discussing a specific technology in a specific context. The first of these, through prototype building and drawings allows participants to represent their perception of the technology discussed. The second, requires the participant to have a pro/con position on the implementation of the technology which can then be modified throughout the session. Even though these tangibles have more defined meanings, they still act as mediators of the discussion complemented by technical language.

From analysing the different representations some characteristics are worth considering for the design outcome of this thesis. First, providing a way for participants to attribute their own meaning on some of the design elements to highlight the multitude of perspectives. Second, framing and guiding the participants' discussion to keep the focus in the context of smart cities. Last, taking a low degree of accuracy for representing the real life context to avoid focusing on the feasibility aspects of technological solutions.

3 PRACTICAL LENS



The following chapter presents the *exploratory research* to address the three research sub questions from the practical lens. First, the approach to semi-structured interviews is presented. Second, the executed reflexive thematic analysis (Braun & Clarke, 2006) is summarised. Third, the six themes identified in the analysis are detailed. The themes are: (1) re-framing by a network of actors, (2) factors triggering a reframing process, (3) practitioners' dilemmas in smart-city collaborations related to a reframing process, (4) factors involved in addressing conflicting values, (5) goals of tools/methods for supporting value discussions, and (6) characteristics of identified tools/methods. The chapter continues into discussing the findings in regards to the research sub questions for the practical lens. Lastly, a conclusion is presented defining the type of tangible representation to be designed: a serious game.

3.1 Interview approach

To gain an understanding of the current practice, and further inform the final result, it was planned to contact smart city practitioners involved in different multi-stakeholder collaborations in the Netherlands to collect their experiences from the field.

Given the diversity of past and ongoing smart city collaborations in the Netherlands, a flexible research method is needed that allows to collect their experiences openly, adapt questions according to the project discussed and delve further in areas of interest as they share their experiences. In order to achieve these goals, a semi-structured interview was chosen as the ideal data collection method. Furthermore,one-to-one interviews, compared to surveys or a co-research session, further allow to focus on individual experiences in an open manner. This method gives the researcher the flexibility to adjust their interview questions as the conversation evolves. This translates to further inquiry based on the interviewee's responses, though the interview structure is flexible it remains important to construct it since they allow the researcher to keep the interview within the desired topic areas (Alshenqeeti, 2014).

Interview structure

The interview questions were developed to translate the practical lens sub questions of this thesis (Chapter 1) into an interview setup. Each interview is planned for a maximum of 60 minutes to cover the different topics and clarify any possible question from the participants. An overview of the interview structure is shown in Table 2, detailed interview structure can be seen in Appendix B.

Participants

Selection criteria: The criteria for selecting participants included (1) previous expertise in multi-stakeholder collaboration in (2) the context of smart cities (3) in the Netherlands. Desk research was conducted to identify organisations who were currently developing or had developed, in recent years, multi- or transdisciplinary projects in the field of smart cities. Reviewing these initiatives opened a space to identify candidates with different backgrounds.

Contacting participants: The first point of contact was made via email to 20 candidates with a short introduction on the research topic and the request to be interviewed via online. For the 10 candidates who replied further details were sent to them, including an information sheet and consent

Research topic	*Estimated time*	*Exploratory research sub questions*	*Sample interview questions*
	5 - 10 min	*(Participant's introduction and current smart city collaboration description)*	
Framing process	10 - 15 min	**(RQ.P1)** How is the framing process of the collaboration occuring in the current practice?	How was the scope of [current multi-stakeholder project] defined?
Conflicting values	10 - 15 min	**(RQ.P2)** How are conflicting values currently addressed during a(re)framing process?	While having these discussions, does it ever happen that the stakeholders have conflicting views?
Tools/ methods	10 - 15 min	**(RQ.P3)** Are there tools/methods currently used to support the discussion of values? If so, why are these chosen?	How do you approach these situations?
	10 - 15 min	*(Participant's questions for researcher and closure)*	

TABLE 2. Overview of interview setup addressing the RQ for the practical lens.

form approved by the Ethics Committee of the University of Twente (Appendix B). In the end, with 9 participants an appointment was set via MS Teams. The group of participants are currently working at the intersection of smart technology and Dutch cities as consultants, researchers and/or mediators of the collaboration (e.g. project management).

Data privacy considerations: Interviews were planned to be carried out in an online setup for two main reasons. First, the logistical constraints of participants residing in different parts of the Netherlands along with the possibility of them having a hybrid work arrangement (i.e. work from home and/or office) in a post-COVID working environment. Second, since a recording was needed for generating a transcript of the audio, the interview would be done via approved software according to UT guidelines for data privacy.

Transcripts (Appendix C) were analysed using reflexive thematic analysis, a methodological approach of data analysis for identifying and systematically analysing patterns of meaning across a qualitative dataset (Braun & Clarke, 2006). The analysis comprised a blended coding approach by using a combination of inductive and deductive coding (Braun & Clarke, 2021). The process proposed by Virginia Braun & Victoria Clarke (2006) involves six phases: (1) familiarisation, (2) generating initial codes, (3) generating themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report; the process for this research is described below.

3.2 Reflexive thematic analysis

Phase 1 started by getting acquainted with the data by editing the software's auto generated transcript while simultaneously listening to the interview recording since multiple misinterpretations had been made by the software. Two editing rounds were done before proceeding into the next phase.

Phase 2 allowed further familiarisation with the data as coding was done along the audio recording which enabled the researcher to, up to some extent, retain the connotative meaning of the participant's speech. The coding process was made manually over printed transcripts annotating a code next to each interesting text snippet; this approach was chosen over digital coding to allow for a more focused process. The researcher used a blended approach of inductive and deductive coding[3] capturing semantic and latent meanings[4]. After all interviews had been thoroughly coded on paper, each snippet was transferred to a MIRO board, a digital platform, to facilitate the identification of pattern in the next phase. At this point, nine transcribed interviews had evolved into 177 codes.

Phase 3 involved the iterative process of combining codes among each other to create an overarching theme by using mind maps that visually centralised similar codes. From a first analysis four candidate themes emerged. Furthermore, themes were complimentary translated into tables along with sample quotes for each sub theme.

In **Phase 4**, after further understanding of reflexive thematic analysis gained through discussions with thesis supervisors and literature research, the guiding questions were restructured and themes reviewed. Under a new lens, the mind maps were rebuilt by re-evaluating the placement of every code within its initial cluster. At this point the thematic analysis included 212 coded excerpts arranged in 37 sub themes belonging to 6 main themes.

Phase 5 comprised a frequent evaluation of (sub)theme names both for clarity or when dividing themes into new clusters. The naming process was supported by visually mapping each theme with its sub themes and developing new tables. The final result included six themes which are described in the coming section.

3. The former refers to a data-driven way in which the coding is done without trying to fit the data into a pre-existing frame, and the latter refers to a theory-driven way in which the coding is guided by the theoretical frame or research questions (Braun & Clarke, 2006).
4. The first relates to explicit and descriptive meanings while the latter to implicit and underlying meaning (Braun & Clarke, 2021).

During **Phase 6** further understanding has been gained through feedback from thesis supervisors, delving into literature and in writing this report. Upon writing this chapter section, further modifications have been made to names and descriptions of both themes and sub themes. The narrative posed by the 6 themes is further detailed in the following section. Under the principles of value sensitive design (Friedman & Hendry, 2019), it is worth to note that this analysis and results are interpreted from the researcher's perspective, experiences and values which has led to an interpretation of the participant's experiences.

3.3 Findings

In the end, through the reflexive thematic analysis, 6 themes were identified that contribute to understanding the in-practice framing process and the approach to value discussions. These themes are displayed in Figure 7.

In the next sections, each theme is discussed in more detail through a description of the theme and accompanying tables giving further insight into each theme.

FIGURE 7. Visualisation of six themes identified through the reflective thematic analysis.

Theme 1

(Re)Framing by a network of actors

Through thematic analysis 43 quotes (in 8 subthemes) were identified related to actors, both human and non human, who through different interactions are influencing the starting frame of the multi-stakeholder collaboration. The stakeholders involved in defining the collaboration frame can be influenced from different angles as identified by the different subthemes, shown in Figure 8. The influence on the frame may come from the (1) funding organisations and their predefined requirements; (2) from the challenges and structure of the city itself; (3) from the technological solutions available and its developers; (4) from political aspects such as elected representatives and/or the (non)existing policy; (5) from smart city initiatives in other cities or countries; (6) from the pre-existing ecosystem of stakeholders already working on the same domain; (7) from those focused on managing the project and their perception of the collaboration; and/or (8) through the feedback received from citizens when the collaboration involves them. Depending on the collaboration's context and practitioners involved, the actors identified may influence the initial frame directly or indirectly and to different degrees. Further details on each sub theme can be found in Table 3.

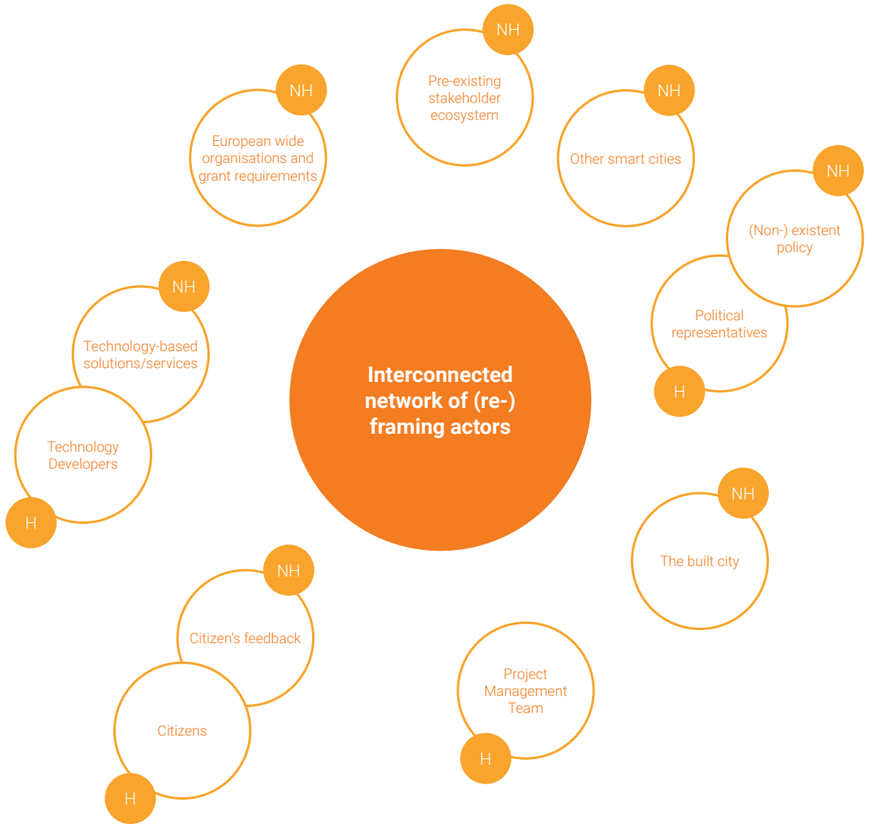


FIGURE 8. Visualisation of Theme 1: (Re)Framing by a network of actors both human (H) and non human (NH).

Sub themes	*Description*	*Quotes*	*Number of quotes*
European wide organisations and grant requirements	Availability of funds, requirements and technical aspects of research proposals act as an initial framer of multi-stakeholder projects.	*"The proposal when you apply for the project you have already a target, some targets. What do you want to achieve? Some objectives, those objectives were already defined."*	6
The built city	The current state of the city, with its infrastructure and services available, has an effect on the possibilities and development of smart city projects.	*"The way things usually go is that. Do you have a specific urban need? so you have something like you have an opportunity and then something that could be improved in your city thanks to smart city technology."*	5
Technology-based solutions/ services and their developers	The implementation of technologies considered as innovative or contributing to improving society's well being.	*"Also the you know the industrial partners have to, are trying to develop new services or like new. Hmm. Yeah, not technologies only, but services. And to create a new business model of OK, this technology, how will be serving or even just to connect to [the city]. How can we make it work and be financially feasible?*	3
Political representatives and (non-) existent policy	The current local/regional/national political agenda influence the opportunities for research. These are further framed by the policy related to the topic or made more complex by the lack of regulations regarding the use of certain technologies.	*"so many times they are also using this as smart city developments as a way of oh look, we are using this technology to make sure that. Uh, you know, we're increasing the well-being of our citizens and then that's that's part of the newspaper […] and then there's a new term."*	12
Other smart city initiatives and implemented projects	Smart-city related initiatives tend to be considered as examples to be followed or replicated in other areas.	*"So then you would hear a lot is like ohh you the the municipality of X is doing this. It would be great to have it too. And then let's have a look at how we can also have it there because you know it's a good promotion for our city or it's a very cool use of technology and let's make it happen so."*	3
Pre-existing stakeholder ecosystem	Stakeholders related to the research domain or with a big presence in the sector influence the research frame.	*"And they all come from very different angles, they share the believe that it's good to have a real physical space to experiment with new technologies. But I think they also have very different, uh motives and interests in doing so. And these are not always so clear."*	6
Project management team	The individual/group acting as project management are perceived as neutral actors that hold a systemic perspective over the project.	*"we yeah, usually work quite good, good at this because we are in the middle as like a bit of a neutral partner. Umm, because we don't really have a for profit assignment or a, we're just interested in the knowledge basically"*	4
Citizen's feedback over developed solution	When considered in the research activities, the positive or negative reactions of the citizens towards the proposed technology has an effect on the research process and its subsequent reframing.	*"there were meetings with the people who live in [the area] and own property in the [area], people weren't really concerned as much with the data aspects of the [intervention], more concerned about Will the [area] be even more busy because of the [intervention]?"*	4

TABLE 3. Detail for eight sub themes in Theme 1 presented with description and excerpts.

Theme 2

Factors triggering a reframing process

Even though this thesis focuses on the initial stage of the collaboration, it is important to consider that the framing process can be reignited (i.e. reframing) multiple times and at different stages of the collaboration. Through the thematic analysis 16 quotes (in 3 subthemes) were identified related to factors triggering to reframe the collaboration's initial plan. The factors forming this theme relate to the long term periods that these collaborations entail and points of interaction among the aforementioned actors, shown in Figure 9.
First, the long term nature of multi-stakeholder collaborations tends to spread over several years from drafting the proposal up to submitting the final report, in this period of time the collaboration frame may be reevaluated due to unexpected external circumstances. The second factor relates to the points of interaction within the collaboration's main stakeholders, these spaces can be aimed at different purposes such as knowledge sharing, team building or project discussions from which the gained knowledge may trigger a change in the different research frames. The third factor refers to points of interaction with external stakeholders, such as citizens or other practitioners, for collecting their feedback and insights on the developed knowledge which in turn may be reintegrated into the project and trigger an iteration of the previous frame. Further details on each sub theme can be found in Table 4.

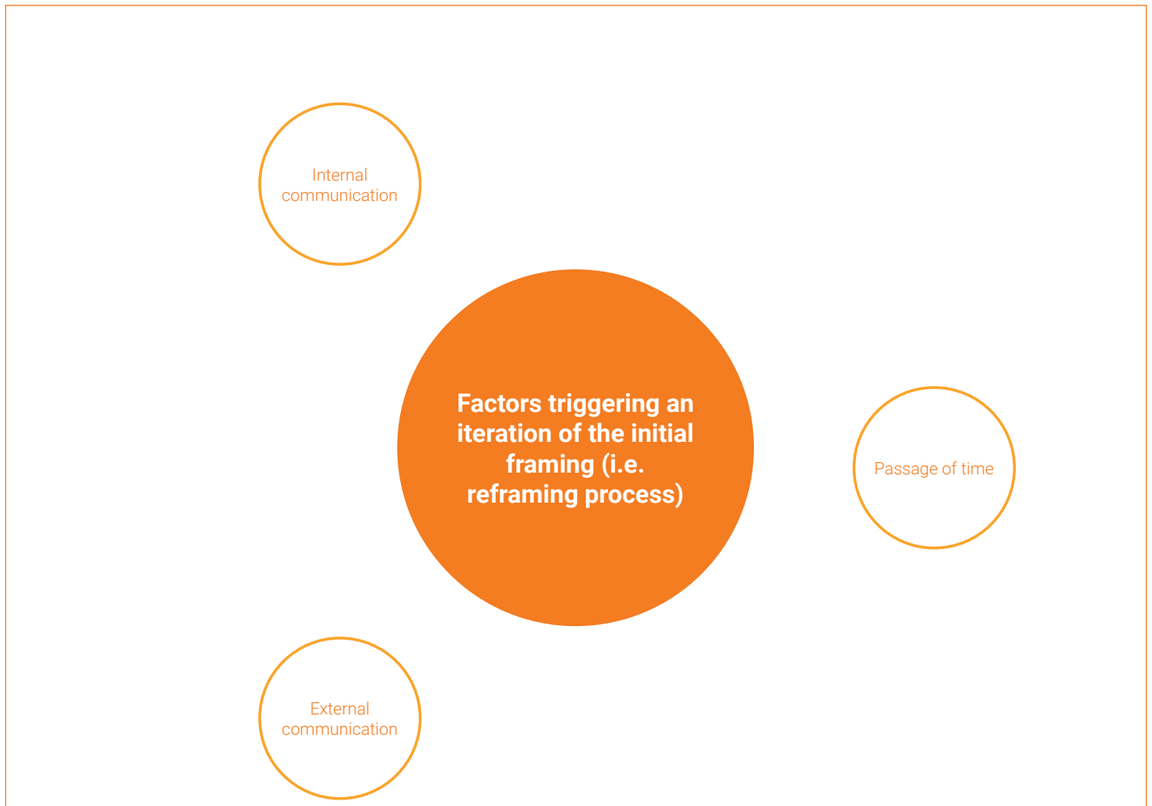


FIGURE 9. Visualisation of Theme 2: Factors triggering a reframing process.

Sub themes	*Description*	*Quotes*	*Number of quotes*
Passage of time and the uncertainty of long term collaborations	The collaboration frame may need to be reevaluated due to unanticipated circumstances or unexpected events at the moment of writing the research proposal.	*"the project goes on and the interesting thing is I have to do, I have to, the actions that I have to undertake now are the, are decided like four or five years back. So that's not always really connecting to the reality of today."*	7
Internal communication: among stakeholders throughout the project	Consortium meetings work as a space for the different stakeholders to reevaluate their research frame based on the work achieved and the challenges encountered.	*"we have these consortium meetings where we come together with the different stakeholders where we discussed kind of steps of the project and also everybody's goals in it through newsletters with each other's updated and individual meetings. I think that's also a core step. But with individual meetings with all the partners kind of to exchange thoughts, ideas and expectations."*	5
External communication: collecting feedback from outside the main stakeholders	Gathering feedback from external stakeholders regarding the intervention under development may have an influence on the collaboration frame. It is up to the collaboration team to decide up to what degree the new information alters their plans.	*"it was already planned to have sessions with the citizens, so it's like you have some objectives, but the really technical towards energy savings, CO savings. What type of materials, what type of technology, et cetera? But these are of course needed to be integrated with the needs of a citizen and the needs of the inhabitant of the building."*	4

TABLE 4. Detail for three sub themes in Theme 2 presented with description and excerpts.

Theme 3

Factors triggering a reframing process

Through the thematic analysis 46 quotes (in 7 subthemes) were identified which relate to conflicting values experienced by the practitioner in multi-stakeholder collaborations in a smart city context. These dilemmas, shown in Figure 10, continue to influence the reframing process since they create a space of reflection for the practitioner to reconsider the path ahead. The identified dilemmas relate to (1) balancing the achievement of societal impact against the completion of grant deliverables, (2) dealing with defining the purpose of the project's outcome between sharing knowledge or making profit, (3) struggling to define whether a new challenge falls within their own responsibilities or is a shared responsibility, (4) dealing with the differences in timeframes from the stakeholders involved and the implications of time wise decisions, (5) reevaluating the appropriateness of the citizen participation strategy initially proposed, (6) dealing with the 'correct' management of citizen's data, and (7) balancing the ethical conversation about the benefits and consequences of technological solutions on societal challenges. These dilemmas can be seen as interconnected since addressing one has an effect in how the collaboration is framed and further executed. A description of each dilemma can be found in Table 5.

FIGURE 10. Visualisation of Theme 3: Practitioners' dilemmas in smart-city collaborations related to a reframing process.

Sub themes	*Description*	*Quotes*	*#*
Achieving societal impact vs. Completing deliverable	Practitioners struggle to balance between achieving a greater societal impact against the importance of meeting the project's reporting requirements. This struggle has an influence on the project framing possibilities for co-creating solutions and/or re-integrating the knowledge gained.	*"Sometimes the output seems more important but reporting is not a goal in itself, but it is a goal"* *"The results of this work will show that elephant in the room sooner or later. So, but at the same time, you have to pick your impact in the sense that if you focus on the elephant in the room, you will never get consensus. You will never do your project, you will never achieve anything […] if you want to create something nice and leave some impact and I think that is good that you pick your winners"*	7
Sharing knowledge vs. Making profit	The practitioner has to deal with defining the purpose of the project's outcome. Balancing the benefits of sharing the research results (e.g. with the citizens, scientific community) or focus on the financial opportunity of limiting the access to the results (e.g. research advantage, profit of private stakeholder).	*"They they are for profit of course so the actual work of the team goes in front of the project work basically, which I see as an innovation activity. But still the project needs to be done before the end of the year because otherwise the grant ends and basically you haven't done the project, so you get less grants as well."* *"There was, yeah, some parties in the group were very hesitant because they felt that, umm, their basically research advantage will be taken away if the data is made open and then others felt like, OK, but we maybe have a what is our time limit here? How much of an advantage do we need? Is it six months? Is it a year? Do we have a right to an advantage when like grants might be from public funds? But on the other hand, if you don't publish, you don't get grants so that's just one example"*	5
Taking action vs. Remaining inactive	The interconnectedness of challenges inherent to wicked problems places the practitioner in the dilemma of deciding whether to engage or distant themselves from related and relevant challenges that emerge along the project, but which may fall outside the current frame of the project.	*"Everyone kind of blame it on these collective problems and then feel individually secure so I can sleep at night being like well it's not my fault"* *"So what do you do then? You. You've done what you can. Uh, you don't necessarily. I mean, it's also your job too. It's not like Do you want to put all your effort into this thing that maybe you don't feel like is 100% your individual responsibility?"*	8
Making short term decisions vs. Considering long term consequences	The long-term nature of multi-stakeholder collaborations involves a balance of different time frames for the different stakeholders. Misalignment on the impact of today's decisions can have an effect on the future project development and solution implementation.	*"The projects goes on and […] I have to, the actions that I have to undertake now are the, are decided like four or five years back. So that's not always really connecting to the reality."* *"There were meetings with the people who live in [the area] and own property in the [area], people weren't really concerned as much with the data aspects of the [intervention], more concerned about Will the [area] be even more busy because of the [intervention]?"*	7
Involving citizens vs. Considering citizen's perspective	The initial framing of the project affects the approach to citizen participation within a participatory collaboration. Further in the project execution, the practitioner has to deal with the morale of this frame when the citizen is not considered/involved as much as the practitioner considers necessary for a successful collaboration.	*"If you supposedly have a democratic government and people pay taxes, and these are for public good, then people might have a right to know [about the technologies implemented] so that they can have more autonomy in public space."* *"You know people, you should go towards them and really build a connection but then they say, yeah, but that's really a lot of work. And we don't have time for that"*	9
Asking for permission vs. Asking for ownership	As the practitioner (plans to) collects citizen's data (mainly in the public space) they come to the dilemma of how to account for the knowledge gained and the future purpose this knowledge might be used for within the project and/or externally.	*"Then we needed approval to make the data public and you don't get approval to make the data public from the citizens. They, they, can't do anything about that. That was an internal decision to make it public. And then you have to go to the Government municipality to say that it's OK"* *"How are you gonna ask people for their permission to be part of your experiments when it's in public space and there's like 20,000 people passing by every day?"*	5
Promoting technocracy vs. Understanding technology	Tech-savvy practitioners, who understand the systemic implications of technological solutions, tends to be the one highlighting the moral/ethical impact of these interventions. This reflection and technical knowledge is then faced with other practitioners/ stakeholders disregarding the impact of (smart) technological solutions.	*"The lot of people still think that technology is kind of neutral. Uh and uh, and there's a lot of faith in the solution and some kind of mindsets that we know from uh, from Silicon Valley. You know, you can fix social problems with technological means. You still have a lot of people having little blind faith in that."* *"So there's this schizophrenic thing in politics, you know, if you ask people what they think of the schooling system or of the way system or transport system, you can have like a whole umbrella of political thought and theory about it. But when it comes to technology, it's just nothing."*	5

TABLE 5. Detail for seven sub themes in Theme 3 presented with description and excerpts.

Theme 4

Factors involved in addressing conflicting values

Through the thematic analysis 29 quotes (in 5 subthemes) were identified regarding how practitioners are currently dealing with conflicting values within the stakeholder group whether at the level of dilemmas or controversies. This theme encompasses how these discussions are happening, (1) whether the controversy is considered resolved as long as the conversation remains on broad terms or (2) being addressed for the purpose of identifying innovation opportunities. The practitioner can also be hindered from engaging in the discussion after acknowledging the controversial issue, (3) the discussion may be avoided to allow the collaboration to move forward without additional complications or (4) the discussion is postponed due to lack of time within the project to embark on that conversation. The last factor influencing these discussions is (5) the willingness to join the conversation, whether from internal or external stakeholders, which is influenced by how knowledgeable in the topic they consider themselves to be. An overview of the subthemes is shown in Figure 11, further details of each factor are given in Table 6.

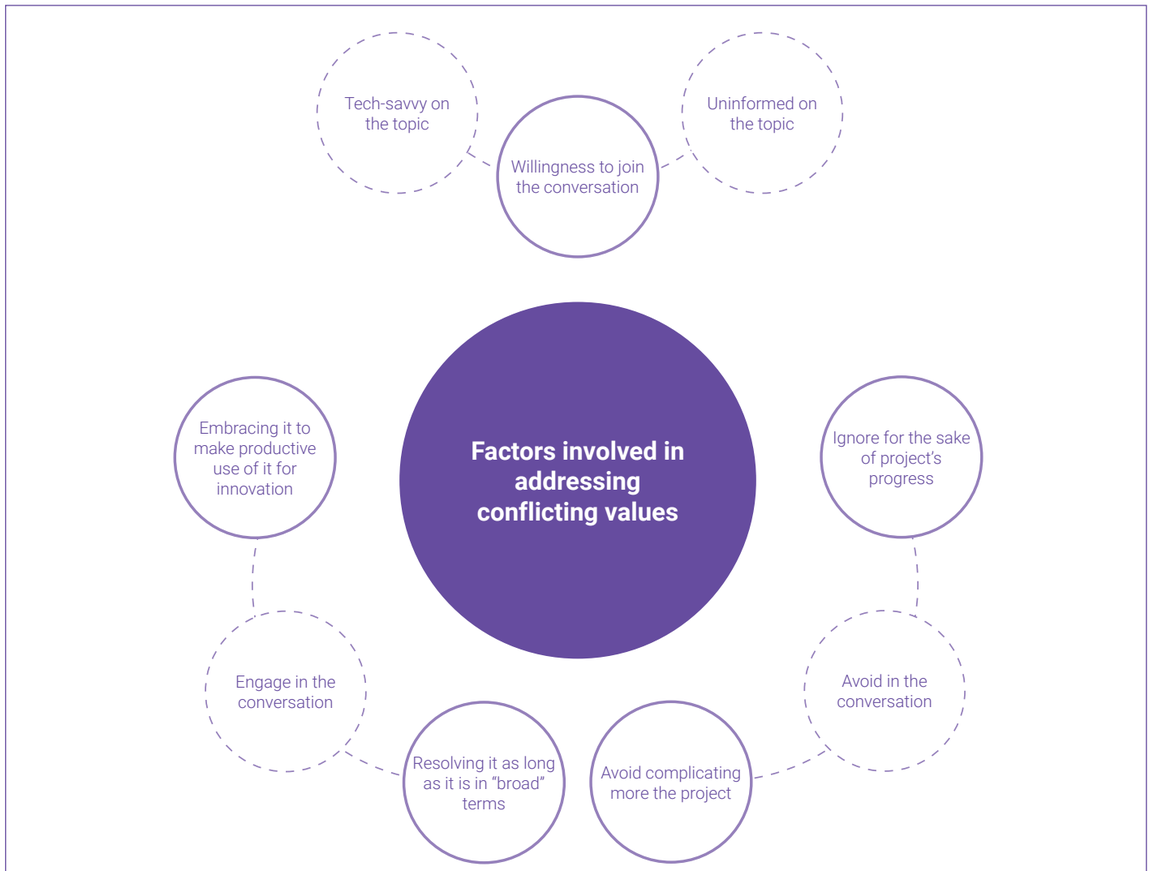


FIGURE 11. Visualisation of Theme 4: Factors involved in addressing conflicting values.

Sub themes	*Description*	*Quotes*	*Number of quotes*
Engage in the conversation: resolving in vagueness	In the case the controversial issue is addressed, it can be considered to be resolved (i.e. no longer a problem) when the discussion remains in broad terms that every stakeholder can agree on the resolution. It is when the specifics of the controversy are discussed that conflicting views may reignite.	*"I mean, everyone would agree with that it's a good thing to do because it's very much on ideologies, big grand themes of innovation and behaviour and mobility"*	6
Engage in the conversation: embrace for innovation	In the case the controversial issue is addressed, practitioners may decide to foster the discussion of controversies with the goal of discovering opportunities for innovation. This new solution spaces may be addressed within the project itself or as igniters of future collaborations.	*"And maybe the project itself would not solve the elephant in the room. But they start to talk about other projects that could solve the elephant in the room"*	5
Avoid the conversation: avoid complicating more the project	The controversy may also be acknowledge and chosen to leave unaddressed. The controversial issue may be intentionally ignored to prevent making the project more complex and/or further obstructing the collaboration.	*"This project is already very complex and then getting it implemented, so then we're really concerned that if we add these layer of complexity to have these conversations, then it's going to make things more difficult so. So no, it's not going to happen for the project."*	5
Avoid the conversation: ignore for project's progress	The controversy may also be acknowledge and chosen to leave it unaddressed. In some occasions practitioners are hindered from engaging in the discussion due to time limitations and/or project workload thus the discussion has to be postponed in order to meet project deadlines.	*"we still thought that the [intervention] was gonna take place. And there was only a few months left. So then there's not so much acceptance for people who try to complicate things like me."*	6
Willingness to join the conversation: tech-savvy and uninformed	Starting the discussion is faced with a knowledge threshold which influences the willingness of the stakeholder to join the conversation. This creates a conversation with tech-savvy stakeholders engaging in more complex implications of technology being at the same table with stakeholders unaware/ uninformed of how current technological systems operate.	*"Is also that I think this is a fringe topic, the only interested citizens who are open are already kind of invested in this, you know? Because and I think that's maybe also a good thing because it's very difficult as a total a new person to come to this field and then have a fundamental good idea about this."*	7

TABLE 6. Detail for five sub themes in Theme 4 presented with description and excerpts.

Theme 5

Goal of tools/methods for supporting value discussions

When practitioners decide to engage in the conversation involving 'delicate topics', where value tensions need to be discussed, they do so through different means but with shared goals. These goals are encompassed in this theme formed by 30 quotes (in 5 subthemes), an overview is shown in Figure 12. The five goals identified are not related to a single tool nor shared by all, but rather an overlap depending on the practitioner's approach to the discussion. Even though this thesis focuses on the initial stages of the collaboration, the discussions of values are happening at different stages of the project. When practitioners decide to open the discussion of values, the tools and/or methods chosen can have the purpose of (1) acquiring a systemic perspective on the challenge at hand, (2) aligning visions among the stakeholders rather than aiming for consensus, and/or (3) identifying and balancing values to define priorities. These primary goals are closely related to generating knowledge for the practitioners' work. The remaining goals, secondary goals, do not refer to the outcome of said method but as what the practitioner can learn from interacting with it. These goals can be to (4) get comfortable with the discussion of values and/or (5) allow stakeholders to discover a new perspective on the topic. Further details shown in Table 7.

FIGURE 12. Visualisation of Theme 5: Goal of tools/methods for supporting value discussions.

Sub themes	*Description*	*Quotes*	*Number of quotes*
Acquiring a systemic perspective	Discussing the controversy from a systemic lens allows practitioners and stakeholders to gain further understanding of the complex network of values and tensions related to the challenge tackled.	*"But at least they are more aware of all these elements that it's not only technical that is not only social, that it's not only financial, but the gathering all of this."*	6
Aiming for alignment instead of consensus	Given the complexity of reaching consensus among the vast stakeholder network working on smart cities, attention is given to create a shared understanding of the collaboration among the group of stakeholders, a co-created vision for the project itself or its outcome.	*"So you can define our issue but then also you have to execute it. So it's very important that what is going to be executed is in some way also Co created so so all the people agree on the same things and all the people is happy"*	7
Defining priorities to balance values/ goals	Discussions involving prioritisation of values, goals or interests from the different stakeholders supports the practitioners in identifying the possible compromises that may resolve the differences among the stakeholders.	*"In an ideal world you breach like the conflicting views but then sometimes you just need to prioritize depending on what you have at stake. So, when that's the case and then you have to accept the trade off, then you need to also think of, OK, how are we going to mitigate right any potential negative consequences."*	6
Getting comfortable with sharing values	In some cases an additional secondary goal was identified, these tools/methods offer the stakeholder the opportunity to get acquainted with expressing their values regarding the specific topic of technological solutions. Implemented as a space of practice rather than real-world discussions.	*"And then this helps you to better be better prepared to have a real discussion with your citizens or whoever, to get some policy across, […] it's also just a great way to get people introduced to the importance of thinking about the technology in the city from from a moral perspective, uhmm, from all kinds of different kinds of views with different values, different roles, because otherwise always the discussion is really limited."*	4
Discovering a new POV	In some cases an additional secondary goal was identified, the implemented tools/methods also contribute to the stakeholder's awareness of different perspectives posed by internal or external stakeholders to the collaboration.	*"but at the same time flexible enough to have a horizontal approach, meaning I don't know more than you. I really want your input, and let's have a discussion"*	6

TABLE 7. Detail for five sub themes in Theme 5 presented with description and excerpts.

Theme 6

Characteristics of tools/ methods for supporting value discussions

The following theme is formed by 49 quotes (in 8 subthemes) related to characteristics of the tools/methods currently used by practitioners and their contribution to the discussion (Figure 13). As in the previous theme, these characteristics are not all found in a single tool nor shared by all but rather identified as a combination in a single tool or method used. The current tools/methods share characteristics such as (1) the importance of tangibility to focus the discussion and trigger reflection, (2) having the discussion of high level (e.g. technical) concepts in low level language, (3) include stakeholders from different spheres to nurture the discussion, (4) support the discussion through fictional settings such as scenarios or roles, (5) guide and keep the discussion within the boundaries of the topic, (6) leave elements of the tangible representation open to the stakeholders' interpretation, (7) create a safe space for having the discussion, and (8) promoting a flexible mindset instead of maintaining polarising positions. Further details of each are shown in Table 8.

FIGURE 13. Visualisation of Theme 6: Characteristics of tools/methods for supporting value discussions.

Sub themes	*Description*	*Quotes*	*Number of quotes*
Tangibility	Tangible representations of the discussion are used to focus the discussion and the co-created result is further used for collective reflection.	*"then that you speculate on this what ifs and then you make them tangible so people can relate to that future and then they can react to it. Because if if you give them like a PDF with these are the plans and then this is the policy and this is what we plan to do. It is really hard. It is hard to really reflect on what does it mean actually. So what does it mean like and especially what does it mean for different stakeholder groups?"*	12
High level concepts in low level language	Lay language for discussing the societal implications of technology is used to allow the inclusion of stakeholders at different tech-savviness levels.	*"you are not going to talk about that the sources to old people because they don't care and they don't understand. So maybe […] you just talk about trees or you talk about benches or you talk about what is represented in that specific technical element that in some way has an impact in the city or in in their environment that they are living."*	8
Inclusion of stakeholders from different spheres	Depending on the tool/method used, different spheres of stakeholders are able to join the discussion to include perspectives external to the core team.	*"It doesn't really matter if it's about technology or waste or education or anything, people are affected by it and they should be able to have a voice about if they like it or not, how they're being affected about it. Or how to fix this city?"*	5
Fictional settings	The use of fictional scenarios and/or roles during value discussions allow stakeholders to voice their opinion in a less personal setting.	*"at the beginning you introduce yourself and you could say, OK, I I I'm. I'm like an entrepreneur of digital company and I really like digital technology. And then you have a totally different kind of role-playing. […] So you can call your own role, which should you you should do based on who you are as a person,[…], otherwise it is really strange."*	6
Framed discussion	Framing the discussion topics and defining boundaries for the conversation contributes to having a discussion of values instead of diverging into other related topics.	*"we also learned in the beginning we had more like fuzzy cases and then we made them really, really strict. OK, this this is the case[…] we bring it back to: this is the case, you have to play within the boundaries of this case because we want you to think about the values connecting to the case and not about the technology of the case itself."*	6
Stakeholders' interpretation	Leaving elements of the tangible representation open to interpretation allow the stakeholder to share their own understanding of the controversy, approaches vary on what elements to leave open and how much.	*"And then by having these conversations and making things tangible and visible then it really helps. And and then something that it's quite important is like we keep it open for participants to have their own interpretations of what is going on, just like in real life."*	3
Safe space for discussion	Creating a safe space for the discussion allows stakeholders to share their opinion away from the pressure of real world settings.	*"[city labs] have these discussions with citizens can be all kinds of things, but they are not, uh, yet really, connected to some real policy. So it's more like a safe space"*	4
Promote a flexible mindset	Discussions promoting a flexible mindset allow the stakeholder to find the setup of conditions with which they feel their values are not at risk or at an acceptable level, instead of keeping the discussion on polarising terms (e.g. absolute pro/con)	*"So it's sort of small core group that basically, yeah, pitches the ball and says like, this is how we're like, we'd like to do it. And then the other partners reflect on it and see. […] So it's a bit of back and forth"*	5

TABLE 8. Detail for eight sub themes in Theme 6 presented with description and excerpts.

3.4 Discussion

The analysis presented in this chapter supports the practical lens of this thesis. This approach was guided by a set of research sub questions to gain an understanding of the current practice, and further inform the final result. Overall, recognising the ethical implications of the practitioners' work leads to facing the resistance of other stakeholders in engaging in the discussion of controversies. Even though it was not identified as common practice, some practitioners have created spaces for discussing the multitude of perspectives among different groups of stakeholders. These discussions are often supported by a physical interactive product. Below, it is discussed how the narrative of this analysis contributes to the research sub-questions.

(RQ.P1) How is the framing process of the collaboration occurring in the current practice?

The process towards defining a problem frame in smart city collaborations is influenced by a network of human and non human actors. As these actors are identified and integrated in the collaboration, they further define the research frame and may trigger a reframing process at a later stage. A notable difference compared to the ideal model by Lang et al. (2012) is the participation and involvement of citizens in the starting phases of the collaboration. From the analysis, citizens are mainly involved as providers of feedback on what the core team is developing (as in Phase B) rather than being involved in the problem definition in Phase A.

Regarding communication, the willingness of some actors to engage in discussions surrounding technology is highly influenced by the technical knowledge they possess. Oftentimes the discourse centres in high-level technical terminology rather than aiming for shared language among stakeholders. There is not only missing a shared language between the core stakeholders and citizens, but also across knowledge types. Both policy makers and technology developers face this communication challenge as they explore technological development. Due to these products and/or services not being completely governed by the existent policy nor constrained by regulations which leaves the stakeholders in a complex ethical loophole.

The initial framing process is influenced by the context of intervention and the actors involved (e.g. EU grant or national funding), however the initial frame is frequently revisited and re-evaluated along the years-long collaboration due to different factors. Similar to the drivers identified by Bijl-Brouwer (2019), practitioners in the field of smart cities are reframing their problem and solution frame by including new perspectives and feedback from stakeholders (internal and external) at different stages of the collaboration. Thus, applying the systemic design principle of Adopting an evolutionary design approach (Bijl-Brouwer & Malcolm, 2020)

(RQ.P2) How are conflicting values currently addressed during a(re)framing process?

Value tensions were identified as dilemmas experienced by practitioners which influence the current frame of the collaboration; either by addressing them or by deciding to ignore them. The identified dilemmas can be related to the categories proposed by Matos Castaño et al. (2020). Dilemmas were found between stakeholder groups, as in Sharing knowledge vs. Making profit, where practitioners have to balance the benefits of sharing their findings against the competitive advantage these can bring them. Dilemmas within groups can be seen in Achieving societal impact vs Completing deliverables where often the practitioner, from the core research team, has to deal with the struggle of prioritising between increasing the project's impact or meeting the requirements for funding. As for dilemmas within individuals, Taking actions vs. Remaining inactive reflects the individual struggle of whether to attend or not to emerging challenges or conflicts which may not be considered as part of the current research frame. Others can be considered at a controversy level such as Asking for permission vs Asking for ownership where the conflict emerges from the interaction of multiple dilemmas on the 'correct way' to collect, process, interpret, manage, and handle citizens' information.

However, facing a dilemma does not translate into acting upon it. For some practitioners engaging in these discussions represents added complexity and hindrance from completing the project. In this case, practitioners are not willing to consider how making their values, or worldviews, explicit can contribute to a better collaboration; which is Horcea-Milcu et al. (2022) identified Perspective 1 to engage with values. For those practitioners who decide to engage in the discussion, it tends to remain in broad terms where the negotiation of values (as in Perspective 2) remains at a superficial level to 'solve' the controversy. Further, some practitioners consider that disentangling value tensions (Perspective 2) can contribute to the collaborative process by discovering new perspectives that reframe the problem and solution space; thus creating an agonistic space. Furthermore, the discussion of values considers its interaction with technology and how they affect the societal dynamic, as seen in the identified smart city dilemmas and as advocated for in VSD.

It is important to recognise that even though not all actors make their values explicit, they continue to frame the collaboration at different stages of the project. These collaborations often need to align to the research areas that will receive funding and/or are promoted by political agendas which shape the frame throughout the collaboration, and the values their intervention will promote.

(RQ.P3) Are there tools/methods currently used to support the discussion of values? If so, why are these chosen?

In the case of those practitioners addressing the value tensions emerging during the collaboration; they opt for multiple tools and methods depending on the desired outcome of the discussion. Goals of the discussion have been analysed as primary and secondary goals; the first focused on content for the practitioners, and the latter to the learning gained by the practitioner/participant. As aforementioned, the goals identified are not related to a single tool nor shared by all, but rather an overlap depending on the practitioner's approach to the discussion.

Practitioners are enabling stakeholders in the collaboration to systematically analyse the controversy or dilemma. This can be related to the systemic design principle Opening up the problem space and acknowledging problem interrelatedness (Bijl-Brouwer & Malcolm, 2020) as the controversy is disentangled to progress in the project. Another principle recognised was Strengthening human relationships to enable learning and creativity, as practitioners use methods that will allow the individual to discover and become aware of new perspectives surrounding the topic. Furthermore, Developing empathy with the system principle can be recognised in the current practice as practitioners aim for a shared understanding of the environmental challenge, by embracing the multitude of perspectives, rather than trying to achieve a consensus.

Furthermore, the different tools used possess characteristics that contribute to opening the value discussion. Practitioners are currently using tangible elements, mainly physical over hybrid, to focus and guide the discussion among the group of collaborators. Enabling a participatory sensemaking process in a situated practice. These physical products allow stakeholders to share their interpretation of the topic addressed by leaving some elements open to interpretation; which was also identified in some of the reviewed tools in Chapter 2. The openness can then be placed on physical elements of the tool or on the understanding of the elements interacting.

Reviewed (Chapter 2) and current tools, share further characteristics such as allowing participants/practitioners to explore alternatives

rather than staying within their mindset. The exploratory approach allows to safely ideate in fictional settings where realistic accuracy is not necessary. Depending on the topic discussed, practitioners will opt to include different combinations of stakeholders; which is also seen in the reviewed tools.

The type of language used in these discussions also varies. Keeping technical jargon as part of the conversation hinders those with a lesser degree of tech-savviness; a challenge of current practice. However, some of the current and reviewed tools allow participants to co-create the language used or intentionally maintain the discussion in low level language. Moreover on the disparity of tech-savviness, the currently used tools keep the situated practice afar from digital components; which is not applicable for all reviewed tools.

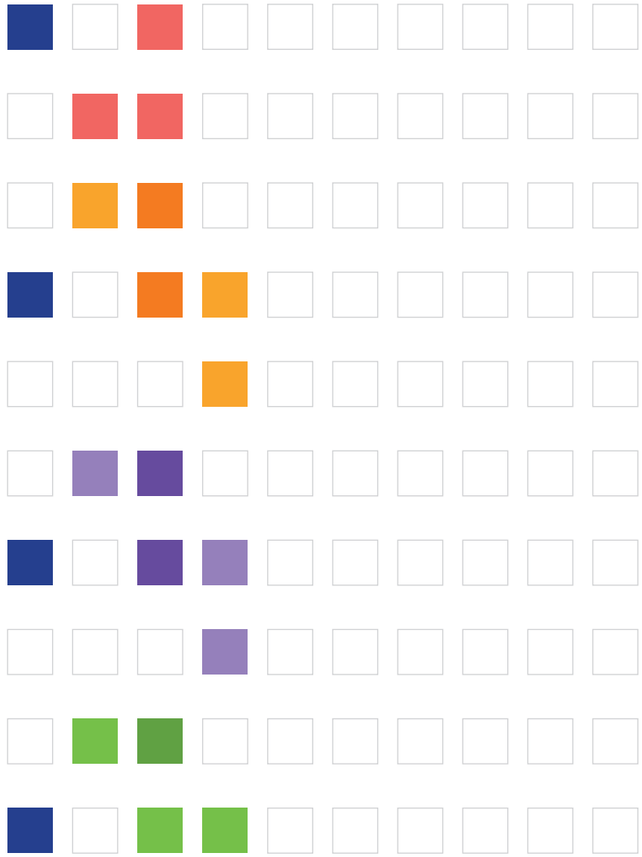
3.5 Conclusion

The final thematic structure provides insights into the research topics, gives answers to the research sub questions and starts framing the solution space of this thesis. Multiple dilemmas have been identified that offer a unique potential to intervene in the socio-technical system of smart cities through a tangible representation.

As posed in the research questions, the type of tangible representation to be designed has remained undefined to avoid narrowing the scope before understanding the scientific research and current practice. In both cases, multiple tangible approaches have been explored to support value discussions. Given the characteristics of tangibles identified in current practice (Theme 3), a serious game appears to be a good fit to support value discussions. This medium has the potential to create a sense of safety for stakeholders to discuss their perspectives. This topic will be further explored by literature in the following chapter.

4 THEORETICAL LENS

PART 2



The following chapter extends on the literature research (Chapter 2) which left undefined the type of tangible representation to be designed. Informed by the analysis of current practice, **serious games** are chosen as the design space to be explored. The relevant literature is presented in the following sections of this chapter. First, literature that shows the potential of serious games and its relation to different types of learning. Second, an introduction to a design approach for serious games. Last, an analysis and discussion of three serious games identified in literature related to sustainable transformations in urban environments.

Serious games literature is reviewed to gain an understanding of the potential of serious games and understand an approach to design them. Moreover, this research will continue to address the research sub questions of this thesis.

4.1 Learning through serious games

Serious games

Serious games can be found at the overlap of education and entertainment. These can create an imaginary world where there is a primary explicit educational purpose complemented with entertainment purposes; thus, games become the medium to deliver a message, teach a lesson or provide an experience (Michael & Chen, 2011). Serious games are an important design medium for education, training, and social change (e.g. societal challenges) since they aim at facilitating deep and sustained learning (Rabindra & Ritterfeld, 2009). The enjoyment of the gaming experience in serious games can have different origins and is highly dependent on the player. Some may perceive the (cognitive) challenge or competition as the most enjoyable aspect, while others may consider role playing or repetitive activities as the most satisfying (Ritterfeld et al., 2009). In either case, Rabindra & Ritterfeld (2009) suggest that the educational purposes need to be blended with the entertainment experience; both aspects need to be closely related through enjoyable learning elements and entertaining components.

The extensive work made in serious games ranges from multi platform digital games (e.g. simulations), computer-supported, analog-supported, up to analog games (e.g. tabletop); depending on the degree computer technology is part of the game experience (Harteveld, 2011). Even though the learning and design possibilities vary greatly along the array of serious games, Harteveld (2011) proposes that the same design principles can be applied to all "games with a purpose" such as those found in Triadic Game Design, explained in the next section.

Arising from the diversity of serious games, simulation games (of real life systems) have been used to support stakeholders' decision-making and learning processes related to complex problems. Rather than making the decision by playing, serious games contribute to early policy-making discussions for *social learning* and collecting feedback (Bakhanova et al., 2020). Bakhanova et al. 's (2020) analysis highlights how serious games, through participatory modelling, can help decision-makers to understand the problem, improve communication among stakeholders, develop solutions, and promote cooperation for joint actions about the complex challenge.

Bakhanova et al. (2020) have identified some of the features in serious games that make it an effective medium for learning. These games allow players to experiment with different strategies of which they can see the outcome in a short amount of time, and they offer a low-risk environment that provides players with a feeling of safety to be creative and explore complex real-word alternatives. The authors further recognise that in the case of role-playing or multiplayer games, these offer an opportunity to understand others perspectives and collaborate as a team through *relational learning*.

Types of learning

Approaches focused on learning have become common in addressing wicked problems. An example of this is *social learning*, which at its core involves participatory and communicative learning that may lead to different social outcomes, new skills and knowledge (Baird et al., 2014). From research in climate change adaptation, Baird et al. (2014) have identified three learning outcomes within social learning. First, *cognitive learning* considers the acquisition of new knowledge or a restructuring of previous knowledge. Second, *normative learning* relates to changes in norms, values or paradigms. Third, *relational learning* refers to an improved understanding of others' mindsets, building relationships and improved cooperation. Given the scope of this thesis, only the latter will be further reviewed.

Enabling relational learning is relevant in contexts including a diverse group of stakeholders with multiple interests, such as in complex challenges addressed by transdisciplinary collaborations that require building effective relationships; which can be supported by serious games (Bakhanova et al., 2020). The authors have found relational learning outcomes in social simulation games in the form of understanding the perspective of others, negotiation, conflict resolution, cooperation, and building consensus and trust.

Collaborative serious games, focused on sustainability problems, have been identified as contributing to acquiring relational learning outcomes (den Haan & van der Voort, 2018). Through self-reflective discussions (e.g. debriefings) after the game session, player's can reflect on their understanding of other stakeholders by analysing the in-game group dynamics.

4.2 From reality to games and the way back

Triadic Game Design

Games can be seen as systems, composed of multiple elements interacting with each other for a common goal within a set of rules; thus, designing a game needs to consider and understand which elements to include and how these elements interact (Harteveld, 2011). Triadic Game Design (TDG) is a game design approach for games with a serious purpose by Harteveld (2011), in which the design space consists of a triad of the worlds of Reality, Meaning and Play. Each world consists of its own aspects and criteria, they are interrelated to the other two, and are equally important; neglecting any of them or unbalanced worlds can make the whole game experience collapse. A summary of each world is presented below:

The world of Reality

Addresses the representation of recognisable elements we can link to reality, even within fiction the game needs to remain connected to reality to create an intuitive and understandable experience. These may be aspects of the real world such as people, organisations, objects, relationships, and domain-specific knowledge. For the latter, an expert can contribute with their knowledge or by identifying the essential elements that need to be represented. In the domain of public policy, games allow one to gain an understanding of the complex relationships and dilemmas that decision-makers have to face and further engage with stakeholders through this medium. Furthermore, within this world the player can be seen as a person who will bring their personality and background which will influence how they relate to the game.

- The main aspects to consider are (1) defining the real-world problem that will be addressed through the game, (2) the factors or actors that play a role, (3) the connections between them, and (4) the process through which they interact and evolve.

The world of Meaning

All games have meaning, it may come from the signs of what the game is about and what needs to be done; they may have a takeaway message about the real world; or attributed by the player's own perception and experiences. For-purpose games aim at having a meaningful effect on the player beyond the game experience itself, either through knowledge, skills or attitudes. The knowledge acquired may be explicit or latent; skills being cognitive, perceptual, motor or interpersonal; or attitudes affected by emotions or feelings triggered by the game. Moreover, the player is considered as an interpretant or learner whose previous knowledge, learning style and expectations will influence how they make sense of the game.

- The main aspects of Meaning include (1) defining the purpose for designing the game, (2) explore the game mechanics that contribute to achieving the purpose, (3) making concrete the mechanisms to achieve the purpose, and (4) considering the context of the game in regards to who, where, and how long it will be played.

The world of Play

Describes the elements that create the game and how they relate to each other, which may vary depending on the game genre chosen; some of them being action, adventure, puzzle, role-playing, simulation, strategy, and virtual worlds. Each has a different set of aspects; thus, designers need to consider which game characteristics fit their purpose, the goal(s) pursued by the players, the gameplay that best supports the goal, and the type of in-game world. Within this world, the players are each considered as having a different way to engage with the game; whether by focusing on succeeding in the goal, discovering the elements within the game, as a socialising opportunity or as competition.

- Within this world, the aspects to consider are (1) the goal the players need to achieve to succeed, (2) the gameplay including the challenges to overcome and the actions to do it, (3) the fictional world within the game, and (4) the medium (digital or analog) and materials that can support the game.

Harteveld (2011) further emphasises that for achieving a meaningful game the three worlds need to be balanced, since modifying one will affect the other and tensions may arise between them; thus, decisions in one world need to consider how it will affect others.

Debriefing

To further support the players' learning process, the embedded aspects of reality in the game allow participants to translate their in-game experiences and results back into their own context through a debriefing phase (Kriz, 2010). According to Kriz (2010), ***debriefing*** refers to methods combining participants' reflections on their experiences with assessment of mental, social, and systems processes to deduce possible applications for real life situations.

The author proposes a six-phase structured reflection, a brief overview is given:

- *Phase 1: How did you feel?* Invites participants to express their emotions after the game has ended to create a certain distance from what has happened and the in-game roles. This role dropping ritual can contribute to a deeper mutual understanding.
- *Phase 2: What has happened?* Participants can discuss their observations about the activity to understand the different positions, such as decisions made and group dynamics.
- *Phase 3: How does the game and reality connect?* The relationship between the game experience and reality are discussed to start transferring learnings to the participants' own lifes; discussion can be focused on roles, rules and resources of the game.
- *Phase 4: What did you learn?* Focuses on participants identifying the most important learning gained whether as a personal insight, from group dynamics or new knowledge.
- *Phase 5: What if...?* Discussion of possible scenarios or how changes in design could have affected the game experience and group dynamics.
- *Phase 6: How do we go on now?* The last phase drives participants to discuss and commit to defined future actions for similar real life situations.

Furthermore, debriefing methods need to support the process to make it as effective as possible; some of these include a guided vs. unguided process, oral vs. written, individual vs. group, same vs. different debriefing tasks (Kriz, 2010).

4.3 Serious games for sustainable transformation

During this research some serious games, with different characteristics, have been identified as providing a space to play and reflect on sustainable futures. Three games are discussed below on their approach to representation, play experience, and debriefing strategy. The games are shown in Figure 14 and briefly described as follow:

- *Future Frictions* (Future Frictions, 2021): a web experience to reflect and debate smart city futures. By exploring a neighbourhood the player can interact with different people and smart city technologies. Players have to make controversial decisions on how to implement these technologies, and see the urban environment and resident's lives change as a consequence of their decisions.
- *Net Zero Game* (Net Zero Game ApS, n.d.): an event-driven negotiation board game for the green transition towards a carbon-neutral economy. The game translates the operation of different industries that need to adapt to the emerging environmental events to conduct a sustainable business. It allows players from different backgrounds to learn about sustainable initiatives, illustrate the complexity of the transition, and demonstrate the importance of STEM.
- *Metrópolis* (Aguilar et al., 2019): a city-simulator video game for smart city planning and decision making. Each player represents a percentage of the population who gets to vote on building projects under budgetary restrictions. Depending on how fitted the approved projects are to the citizens' needs, a happiness score is calculated. Each project has a different effect on the city such as space used, construction cost, and other monetary values.

Future Frictions (Future Frictions, 2021)

Metrópolis (Aguilar et al., 2019)

Net Zero Game (Net Zero Game ApS, n.d.)

FIGURE 14. Visualisation of the three reviewed serious games. Games shown are: Future Frictions, Net Zero Game, and Metrópolis. Images, accordingly, adapted from Future Frictions (2021), Net Zero Game ApS (n.d.), and Aguilar et al. (2019).

These games have different approaches to a sustainable transformation of cities. The first, focuses on the social aspect through a reflective approach to technology for the city's improvement and the impact on residents' lives. The second, focuses on promoting a sustainable practice in business to address the environmental impact of their operation. The third, advocates for informed policy decision making by exploring different proposals that can address a majority of citizens' needs.

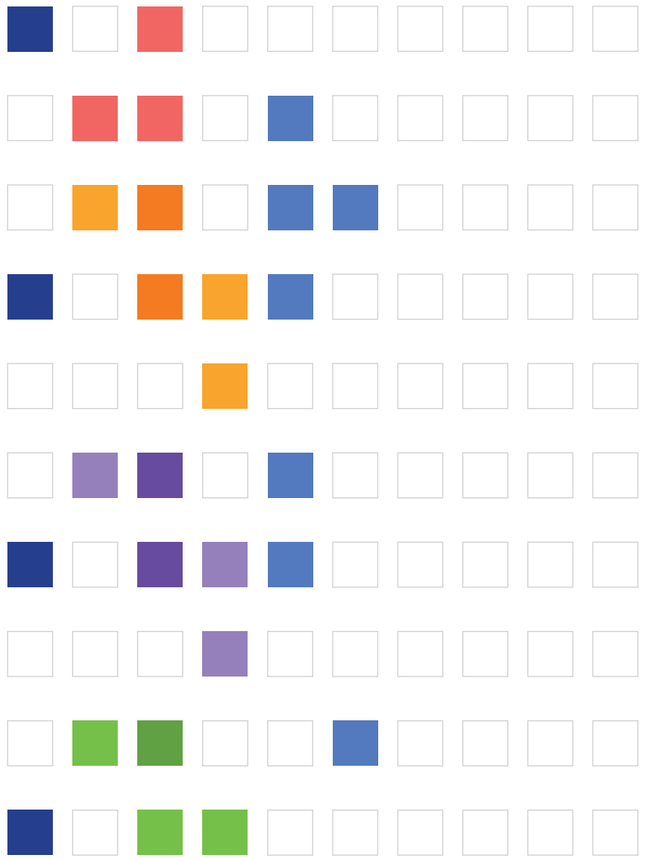
Moreover, the games include technical knowledge presented in different formats (Figure X). First, through a digital montage of representative city elements in a narrative structure with a low accuracy of real life cities. Second, physical game elements with technical information that allow players to learn a different way to conduct business and their life cycle impact. Third, a digital interface to modify the city's model based on quantitative parameters aiming to represent it more accurately.

However, these games do not allow players to give as much of their interpretation on the topic but are rather expected to understand the knowledge already present in the game. The technical level used has been identified as an obstacle to join technology discussions (Chapter 3). The games also present predetermined solutions to address urban problems with a limited space for players to explore according to their perspectives. Thus, collecting feedback from citizens instead of involving them in the process (Chapter 3). Furthermore, for those involving a negotiation process during the game, players resolve dilemmas by weighing the economical value of their options rather than the societal implications of the proposed solutions. Thus, the long term consequences of their actions remain unaddressed (Chapter 3).

Even though all games have been explored within workshop sessions, post-game discussion is only constant in one of them. Future Frictions includes a post-game reflective discussion which guides players as they address the identified controversies and the impact of technology in their lives.

From analysing these games some characteristics are worth considering. First, the technical knowledge in the game needs to consider that players may not be acquainted with the terms or possible functions of smart city technologies. Second, the low accuracy to represent real life cities can contribute to focus the discussion on values rather than economical feasibility. Last, a debriefing phase is necessary to support the reflection on technology's impact.

5 IDEATION PROCESS



The following chapter presents the ideation process followed, from dilemmas as design opportunities to a game design through Triadic Game Design (TDG), and an informal playtest session before defining the last game design for *NewEarth*. First, this thesis presents the seven dilemmas used as the starting point to define a design opportunity, leading to two design concepts. Second, concepts A and B are further conceptualised as four game concepts. Third, an iteration on the concept framing redefined the game's goals which in turn led to a complete game concept. Lastly, this concept was further detailed and playtested to gain feedback on the world of Play for the final version of *NewEarth*.

5.1 Design opportunities

The dilemmas identified (Chapter 3: Theme 3) offer an opportunity to approach the challenges of the multi-stakeholder collaborations designing smart cities in the Netherlands. Through brainstorming, seven dilemmas were first explored individually as potential areas for influencing in the system. Two dilemmas were discarded at this stage. The analysis progressed by considering the connections between them as an opportunity to better support multi-stakeholder collaborations. Three concept directions resulted from this analysis.

Starting with seven dilemmas

The analysis started through brainstorming on what makes the dilemma worth being the starting point for change. As a result of this exercise two dilemmas could already be discarded. First, (3) Taking action vs. Remaining Inactive focuses on a specific individual conflict which can be indirectly addressed by designing for other dilemmas. Second, (6) Asking for permission vs. Asking for ownership even though it is specific to smart cities, requires stakeholders to already have an understanding of smart technologies.

Three concept directions

Brainstorming continued by exploring pairings of dilemmas. Due to the connections between them, addressing two of them presents the opportunity to indirectly affect others. Three different combinations were defined based on their potential contribution. The analysis of each pairing is summarised in Table 9. An overview of each concept is presented below.

- *Concept A:* Smart city collaborations can benefit from creating a space for reflection on technology's implications. This discussion needs to consider the multitude of stakeholders affected by it. However, many are reluctant to engage in the discussion of controversies due to not understanding the technology discussed, frequently in technical terms. A design opportunity can be found here. Involving citizens in technology discussions can nurture the smart city collaboration in two ways. First, by exploring the different perspectives, and values, surrounding the urban challenge. Second, by providing a space to comfortably engage with controversies. Yet, this discussion needs to address the differences in knowledge among stakeholders.
- *Concept B:* Urban technology design processes can benefit from discovering citizens' perspectives. The ethical implications of technology leads to controversies being often ignored instead of embraced. Engaging with controversies can help exploring the challenge and solution space from a different perspective. A design opportunity can be found here. The collaboration can be nurtured through a discussion focused on discovering the multitude of citizens' values that will be affected by technological urban interventions. Doing so at the beginning of the project, project stakeholders can reconsider their approach to citizen participation as essential input for their work.
- *Concept C:* Project stakeholders starting to work together can benefit from discussing their perspective on the challenge by recognising the dilemmas and controversies they may face along the way. This discussion can help them align their visions on the project as they begin to frame the collaboration and the challenge. This presents a design opportunity. Supporting the value discussion between the team can nurture future stages of the collaboration. By exploring the approach to reintegrating the generated knowledge and their collaboration with the societal sphere. Moreover, understanding the controversies they will be addressing as a collaboration and which controversies are out of scope.

Selecting a concept direction

Through further brainstorming, the three directions were compared between them.

Out of the three directions; concept C relates the most with internal project management and team building instead of the wider stakeholder network. An intervention in this space may remain at a vague level and not necessarily with input from citizens.

Designing from a set of values may align with the overall approach of VSD, however limiting the value discussion to the core team contradicts the identified importance of societal practice in TD collaborations. For this reason, concepts A and B show a greater potential to design for. These are further conceptualised through a Triadic Game Design (TDG) approach in the following section.

	Concept A	*Concept B*	*Concept C*
Dilemma design opportunities (Theme 3)	*(4) Marking short term decisions vs. Considering long term consequences*	*(5) Involving citizens vs. Considering citizens' perspective*	*(2) Sharing knowledge vs. Making profit*
	(7) Promoting technocracy vs. Understanding technology	*(7) Promoting technocracy vs. Understanding technology*	*(1) Achieving societal impact vs. Completing deliverable*
Why intervene here?	Start the conversation on the morale of smart technologies in an urban context.	Gain new insights for the design of technology through the citizens' perspective.	Enable the core research team to align their visions through a value discussion of the impact they strive for.
How will it affect the current approach to controversies? (Theme 4)	Increase the willingness of stakeholders to join the conversation about technology.	Promote productively embracing controversies to innovate.	Prevent practitioners from avoiding the discussion of controversies.
Main dilemmas indirectly addressed	*(5) Involving citizens vs. Considering citizens' perspective*	*(6) Asking for permission vs. Asking for ownership*	*(4) Marking short term decisions vs. Considering long term consequences* *(3) Taking action vs. Remaining Inactive*
How does it contribute to TD collaborations? (Theme 5)	▪ Acquiring a systemic perspective ▪ Getting comfortable with sharing values Forms of relational learning.	▪ Getting comfortable with sharing values ▪ Discovering a new POV Forms of relational learning.	▪ Defining priorities to balance values/goals ▪ Aiming for alignment instead of consensus Forms of relational learning.
Intervention goal	Creating a levelled knowledge field to discuss technology.	Design technology from a value-sensitive frame including multiple perspectives.	Planning for the future from the start to align values and embrace controversy.

TABLE 9. Overview of dilemmas explores that lead to three design opportunities explored through brainstorming.

5.2 Multiple worlds of Play

Defining the triad of worlds

Brainstorming using the triad of worlds in TDG, the aspects of each world were explored one at a time (Appendix D). For ***Reality***, the aspects between Concept A and B are quite similar since real-world cities are the main context to emulate. The ***Meaning*** world starts to diverge among concepts as each aims for a different learning goal. For each concept, the world of ***Play*** was further divided in two explorations leading to four game concepts. The summary of brainstorming each world can be found in Appendix X. So far, some general decisions have been made such as: using an analogue/tabletop game to remove the technology threshold from the discussion, multiplayer setup of minimum 5 players, promote value elicitation and negotiation, and take on the role of different stakeholders. Sketches of each concept described below are shown in Figure 15.

Concept A

Goal: create a levelled knowledge field that allows citizens to understand the current state of technological implementation in the city as policy makers & tech developers gain insights into the citizens' perspective.

- **Concept A1:** Taking on roles, players have to negotiate the technology and policy for their fictional neighbourhood. By moving from 'private' to a 'public space', players can move their resident cards according to how much these fictional roles would agree with the smart city proposal. Giving over technical explanations that nobody understands can make some residents want to stay in their houses or start a protest against it.
- **Concept A2:** Players need to understand, design, and frame interventions that address the problems their fictional city is facing. By stacking cubes, citizens, policy makers and tech developers, can collaborate as they 'build' their intervention together. However, citizens are allowed to ban overcomplicated words, if too many words are banned the game will come to an end even if there are problems left unattended.

Concept B

Goal: allow the core stakeholders to gain an understanding of the citizens' perspectives, and values, to create a value-sensitive project frame that guides the design process of the intervention.

- **Concept B1:** Collectively, players need to create the buildings on their street by first laying the value-foundations, moving in residents that agree on those foundations, and finally,improving the building with technology. However, residents can decide to move out when they disagree on the technology or new ones can move in that agree on the redesign. A smart building with no residents would be the worst case scenario.
- **Concept B2:** All kinds of citizens live in this city, they all experience city life differently, and prefer different things. Taking turns, citizen-players can mark in the city map the places, currently designed, they feel represented by. The city has challenges to address, for which two parties (anti-tech and pro-tech) have to provide some solutions, on which citizens can vote on. Creating interventions that are rejected by most citizens will not make the city a desirable place to live.

Feedback & reframe

As shown in Figure 15, these concepts were mainly explored by sketching the components of the game and some interactions between them; however, not all mechanics had been defined at this point. Through a feedback session with thesis supervisors further insight was gained. The current concepts promote a participatory process rather than transdisciplinarity. First, the citizens playing the game need to 'catch up' on the terminology in order to understand the design decisions made by the other players. Second, the role of the citizens remains as feedback providers of the proposed solutions rather than being integrated in designing the technology. Informed by this, a new concept was developed.

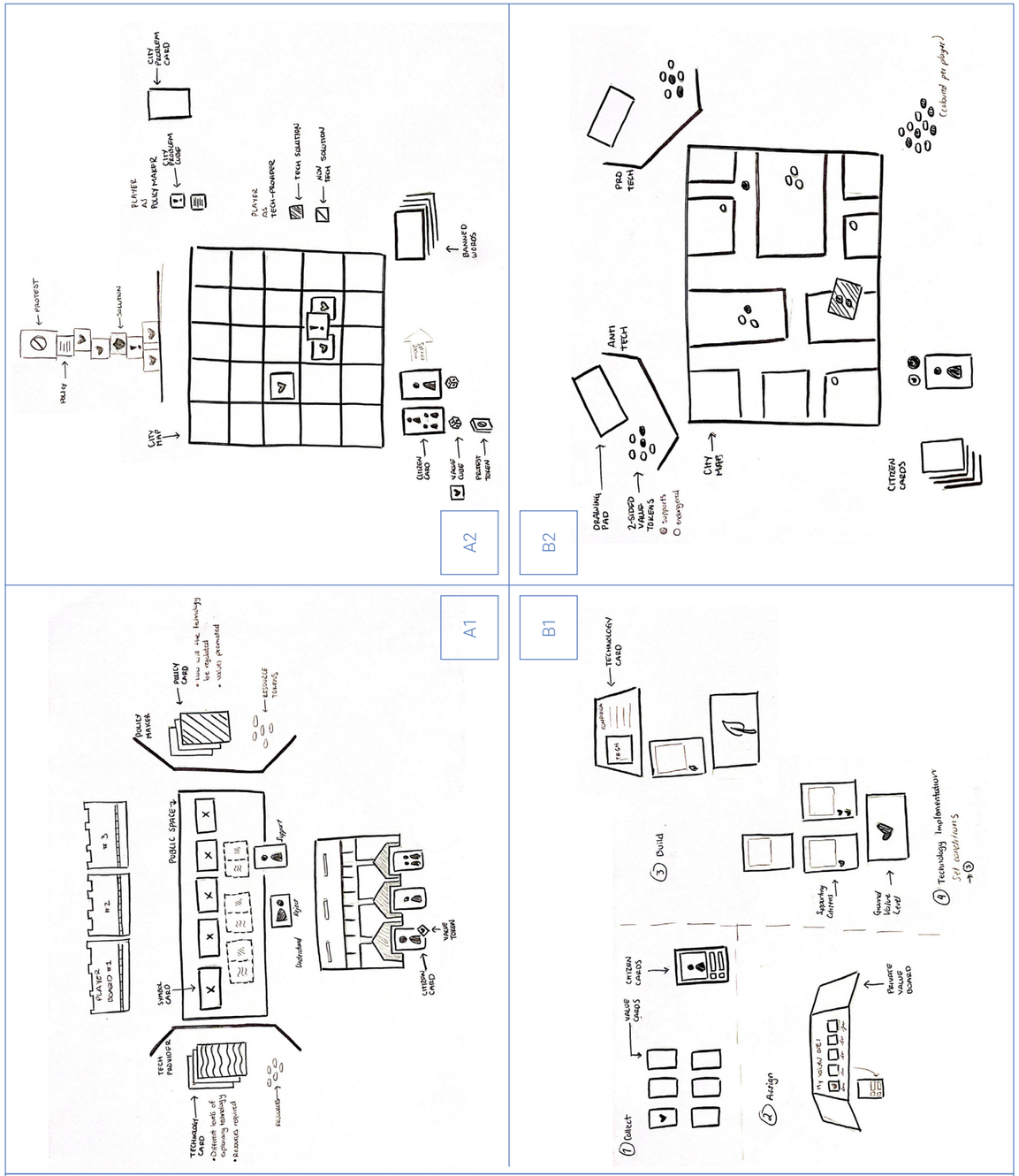


FIGURE 15. Sketches for initial concepts (A1, A2, B1, B2) showing the starting game components considered, phases, and interactions.

5.3 Concept reframe

Reframing the worlds triad

Following the feedback and reframing, further brainstorming led to a new dilemma combination. Reframing *Reality* and *Meaning* was necessary before further definition of *Play*. For this, a new dilemma combination was analysed to attend the issues from the initial frame. The new frame is found below in Table 10, see Appendix E for details on each world.

With this frame, the design process continued towards reframing the single goal into two goals which addressed different levels of the design intervention. First, a *meta-goal* that defines the need within the system in order to promote a transdisciplinary approach; this aligns to reframing the world of Meaning.

Meta goal: Create a levelled knowledge field to discuss smart cities

The design outcome of this thesis has the goal to create a levelled knowledge field among the stakeholders involved in and affected by smart city collaborations. Stakeholders such as researchers, policy makers, technology developers, citizens, and any other individual or organisation who may be affected by the urban transformation. Supported by this game, stakeholders with different levels of tech-savviness can co-create a balanced ground where to express, and negotiate, their values and how these might be compromised by urban technological solutions.

Second, the *game goal* starts the translation from the world of Reality into the world of Play. By a further exploration of the previous worlds of Play, valuable mechanics and components are brought into the final concept.

Game goal: Co-create a smart city where players want to live in

In a fictional world, players, in their roles, need to complete a series of tasks in order to create a new city where they can explore how certain technologies can benefit them. However, the negotiation will have to remain in everyday language where all roles can engage in the discussion. Moreover, creating a space in this new world can only happen when every player agrees to do so.

	Final concept
Dilemma design opportunities **(Theme 3)**	*(5) Involving citizens vs. Considering citizens' perspective*
	(7) Promoting technocracy vs. Understanding technology
	(4) Marking short term decisions vs. Considering long term consequences
Why intervene here?	Citizens will have to deal with new technologies being deployed in their everyday context with little consideration of their view. Technologies that aim at addressing urban challenges also have an effect in peoples' lives for the coming years. Starting the value discussion on technology's implications, and embracing the emerging controversies, can contribute to getting comfortable with engaging with controversies and negotiating values.
How will it affect the current approach to controversies? **(Theme 4)**	▪ Increase the willingness of stakeholders to join the conversation about technology. ▪ Promote productively embracing controversies to innovate.
How does it contribute to TD collaborations? **(Theme 5)**	▪ Discovering a new POV ▪ Getting comfortable with sharing values ▪ Acquiring a systemic perspective Forms of relational learning.
Intervention goal	Discover different perspectives while discussing technology on a levelled knowledge field.

TABLE 10. Final concept exploration by reframing the worlds of Reality and Meaning.

The main game design decisions made at this point are to create a game where players:

- Take on fictional roles that will explore a new planet that is very similar to Earth
- Have to negotiate and discuss as a group their individual decisions
- Pack 'building resources' to create their new city, which are open to interpretation by players
- Learn about technologies before adding them to their city
- Have a mechanic limiting the language allowed during the game
- Have a container where to place or discard from resources

The tangible exploration

For the world of Play, the ideation process moved towards tangibles to start exploring combinations of game components and gameplay. As seen in Figure XSKETCHES, the initial elements were developed at this stage such as role cards, in-game goals, boards, actions cards, letters to represent the fictional scenario. These paper components are not made at an accurate scale to keep the exploration flexible and quick to modify. The final exploration and game design can be seen in Figure 16.

Feedback & reframe

Explaining the game to other people resulted in an insightful complement to the tangible exploration. At this point a general gameplay was defined. However, explaining the game to people (as explaining the instructions to any other boardgame) quickly highlighted the confusing parts of the gameplay, and the relevance or absence of certain components. Mainly, the design contained multiple game mechanics and components *too* open to the player's interpretation. For developing the final concept each component was reiterated with more detail.

FIGURE 16. Tangible exploration of game components (tokens, cards, and boards) in different shapes and colours.

5.4 Concept detailing

Building the final world

At this point, further detail in Play was needed, both for the fictional setting and the game components. For detailing every component and phase, literature research (Chapter 2 and 4) and the findings from exploratory research (Chapter 3) were used. To emphasise the world of Meaning, the game goal was further defined to create in-game goals defining the purpose of the city to be built. To give an in depth description of how theory and practice informed the game design, a detailed description is given in the next chapter regarding the final game design.

Materialising the game

Once the components were defined in text they were translated into different materials (Figure 17).

It is important to note that every component, even if they are made of paper, have a different size to make them easy to identify. Each phase is colour-coded for clarity of which components correspond to each part of the game.

Some components are afforded an intuitive use by relying on their tangibility, making use of their physical dimension to embody certain player's actions. Such as in the wooden blocks which can be stacked to build; a clarify alert that does not require to speak in order to ask for a clarification; or a shipment container that collects the individual and collective understanding of the problem and the solution. Players then do not have to rely exclusively on verbal communication to engage in the collaboration. Their collective sensemaking during this process can be supported through tangible components that allow them to enact ideas through actions that have an impact in the physical world (e.g. stacking, knocking, packing). Furthermore, it is not only through their physicality that the wooden cubes act as the principal mediators in this situated practice. Their symbols do not have a predefined meaning attached to them. Hence, it is through the players' interpretation of each symbol that their meaning becomes socially constructed; and thus representative of their individual and collective understanding of the problem.

FIGURE 17. Overview of some game components as developed for the informal playtest session.

Playtesting the world of Play

Once all components had been materialised, an informal playtest session was planned by the designer to test the created game. This session took place with participants who are frequent game board players.

External input was necessary before the final playtest session to understand three main aspects. First, understand how the fictional setting was understood and identify loopholes in the narrative. Second, understand if the components, and its content, were understood and used as expected. Third, understand how the gameplay developed from the perspective of players instead of the designer; further attention was paid to allotted times for each phase and the negotiation dynamics.

Feedback & final reframe

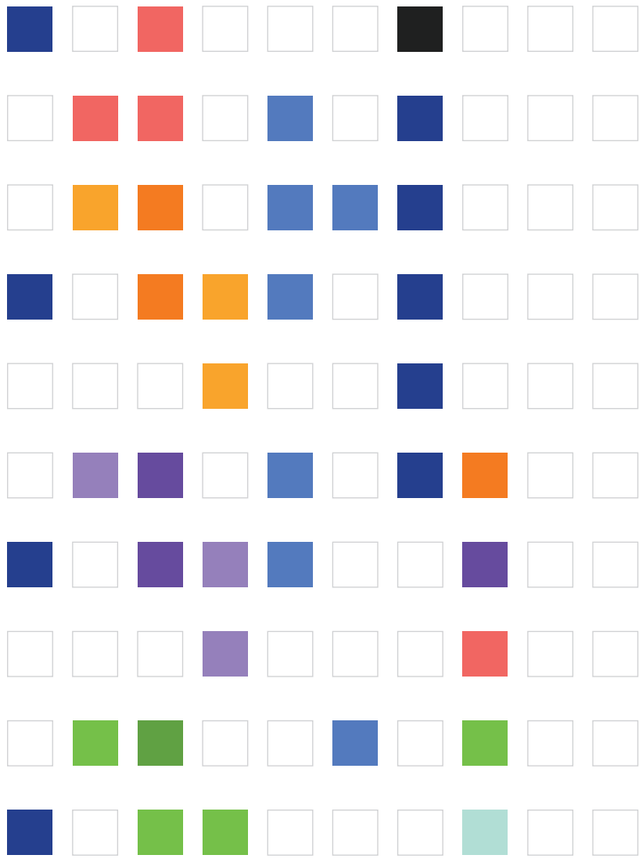
Narrative. The letters guiding the narrative of the game helped the players understand the setting and further embrace their roles. Minor loopholes were recognised and clarified for the final version. However, the role sheet included more background information that needed which ended up confusing and overloading the players; specially those who have not played a role-play game before. Overall, the game phases aligned with the narrative as planned and players recognised the value of having each one of them.

Game components. Content-wise, three components caused the most confusion. First, the in-game goal as it was written confused the players, the frame of the goal required to consider many factors at the same time. Due to this, all three in-game goals were edited. Second, the mechanic of having 'veto power' hindered the exploration of solutions and the negotiation among players. Those who had the most veto cards opted to wait for the final proposal to see if they agreed or not, instead of joining the discussion. This component was removed for the final game version since it was detracting from the goal of the game even if it represented a dynamic of the real life system. The clarity alert helped to keep the discussion, and some roles, away from technical terminology. The third component was one of the three technologies introduced in the game. The description text was recognised as overlapping with another technology which caused confusion when considering its application. This technology was later replaced for another smart technology which represented different alternatives.

Gameplay. The sequence and division of phases contributed to the game goal, even if it exceeded the allotted times. None of the phases had a time limit for the players, just an estimated time by the designers. The winning condition was not met (Have you created a smart city that addresses the in-game goal where you want to live in?). Allowing players to share their individual answers sparked an immediate discussion, out of their roles, of how the game had progressed and what they could have done differently. Even though the debriefing is the final phase of the game, this was not tested during the playtest session for two reasons. First, the game was already over three hours long and players were tired from the cognitive effort of the past hours. Second, the initial goal of the session presented to players was to evaluate the gameplay of design rather than the meta goal of the design.

With the insights and feedback from this session, the overall design and components were revised and modified for the final playtest session.

6 NewEarth



The following chapter presents the final design of *NewEarth* informed by research and the informal playtest session. The game presentation is introduced in the following order. First, the general game characteristics are presented. Second, the game's fictional setting is introduced along with its relation to the game phases: *Pack, Discover, Reduce,* and *Build*. Third, a description of each game component is given based on the theoretical input informing its design. Lastly, the gameplay is described presenting the interaction between the components in each phase and accompanied by the moderator's and players' actions.

6.1 Game characteristics

Game genre

Negotiation for relational learning

The final design approaches values from two perspectives, making them explicit and negotiating them; in order to promote a relational learning outcome where players gain an understanding of the multitude of perspectives that can shape their cities, and the technology in them. Throughout the game players will need to cooperate and negotiate as they try to understand others' perspectives.

Target audience

The game is intended for stakeholders from societal and scientific practice to inform smart city collaborations. Especially for collaborations which are starting to work together and/or are starting to frame the research challenge for the coming years. The game embraces the diversity of perspectives surrounding smart cities which are to be discovered by playing the game. Moreover, recognises the possible difference in tech-savviness and technical knowledge among the stakeholders affected by smart city technologies.

Game goal

Co-create a city that fits the in-game goal where you want to live in

Within the fictional setting of the game, players, as their roles, need to complete a series of tasks in order to *co-create a city that fits two criteria*. First, the design of the new city needs to address specific environmental challenges currently present in the Netherlands where smart technologies are being implemented; the in-game goal. Second, the city they co-create should be a space where the players want to live in based on the worldview of their fictional role.

Some in-game goals are presented to players, these reflect current environmental challenges the Netherlands is facing in urban spaces and which are being addressed by smart technologies (see Chapter 2 for overview); further details presented in next section of this chapter.

Number of players

5-7 players plus moderators

The number of players is flexible to accommodate different groups sizes, this range allows to have multiple perspectives without becoming an unmanageable discussion. How the number of players affects the gameplay is further detailed in following sections of this chapter.

The role of the moderator, ideally, is meant to be taken by someone who has had previous experience of playing the game rather than experience in smart city projects. The moderator is meant to set up the game, explain the rules, and clarify doubts regarding the game. But the role does not include making decisions on behalf of players, nor managing the discussions beyond keeping track of time.

Estimated playtime

3 hours

The estimated playtime is of 3 hours which comprises role creation, four game phases, the debriefing discussion, and two short breaks along the game. During this time, and through different game components, players will get to reflect on their values, negotiate their visions for the city, and build different solutions that address the environmental challenge selected.

6.2 Game story and structure

The fictional setting of the game is told by the moderator and supported by 4 letters throughout the game. The story and game phases are described below (Table 11), the letters are further detailed in the following section.

On a different planet called NewEarth, humanity has a second opportunity to grow and inhabit new spaces. The current administration of this planet has their own rules to create cities, but the most important one is to live in harmony

with nature; they don't want to repeat the same mistakes people on Earth have allowed. Some of the first people to go are sitting around the table today. It is your own perspectives and experiences that will set up the laying foundation of how future citizens of NewEarth will live. Embarking on this journey may require some compromises but we need to make the most out of this opportunity.

By the end of the game, through a debriefing phase players will be able to translate their game experience into their own context of collaboration. Guided by Kriz (2010) phases, the end mechanic of the game links to the final discussion through a guided, oral, and group debrief. Starting by sharing their voting results, the discussion is structure as follows:

- Voting results: What did everyone write down?
- Phase 1: As we step out of our roles, how did you feel with your roles?
- Phase 2: What could you have done to achieve a different result?
- Phase 3: What did you learn about collaborating with stakeholders from different backgrounds?
- Phase 4: What can you take from this experience for future collaborations?

6.3 Components

The following section presents a description of the game components and their theoretical basis, the interaction among these is presented in the following section. Appendix F includes all components in full size.

Role sheet

5 roles & 5 sets of worldviews

The game includes five different roles representatives of the actor network identified in literature and findings from the thematic analysis: policy maker, CEO of a tech startup, researcher, nature, and citizen. When the game is played with six or seven players, the number of 'citizen' roles increases. The description of these roles is presented in a ***Role sheet*** (Figure 18). First, including a 'vague' short description of their role within the city and interactions with the built environment; the openness of this description is meant to be nurtured by the player's chosen worldview, and therefore their chosen values. Five statement clusters from De Witt et al. 's (2016) worldviews were selected, related to nature and the city, that create the role's complete description. From each of the five sets of statements, players can select the one they want to impersonate during the game, whether it is representative of their own thinking or not. The second section of the role sheet poses two questions for the player to round up their role; first, an introduction of their role combining the information from the left side of the sheet, and second, their vision of a smart city that considers the in-game goal.

Game phase	*General task description*
Introduction	Create roles using ***Role sheet***, fictional or representative of their own thinking, to represent the stakeholder (Policy maker, CEO, researcher, citizen, nature).
Pack	As their role, define ***Earth resources*** needed for the new city such as (1) those that can contribute to the in-game goal and (2) those contributing to the problem but that can be redesigned to contribute.
Discover	Discover and select smart technologies through ***Tech-resources*** that can contribute to the vision of the new city.
Reduce	Select resources to discard that are not considered to contribute to the in-game goal, as a group may select some to recover.
Build	Co-create a city that meets the ***in-game goal*** by sharing the resources collected, spaces built should also consider the role's worldviews.
End of game	***Vote*** yes/no whether the in-game goal has been met according to the player's worldview. Debriefing of experience.

TABLE 11. Overview of game structure for NewEarth.

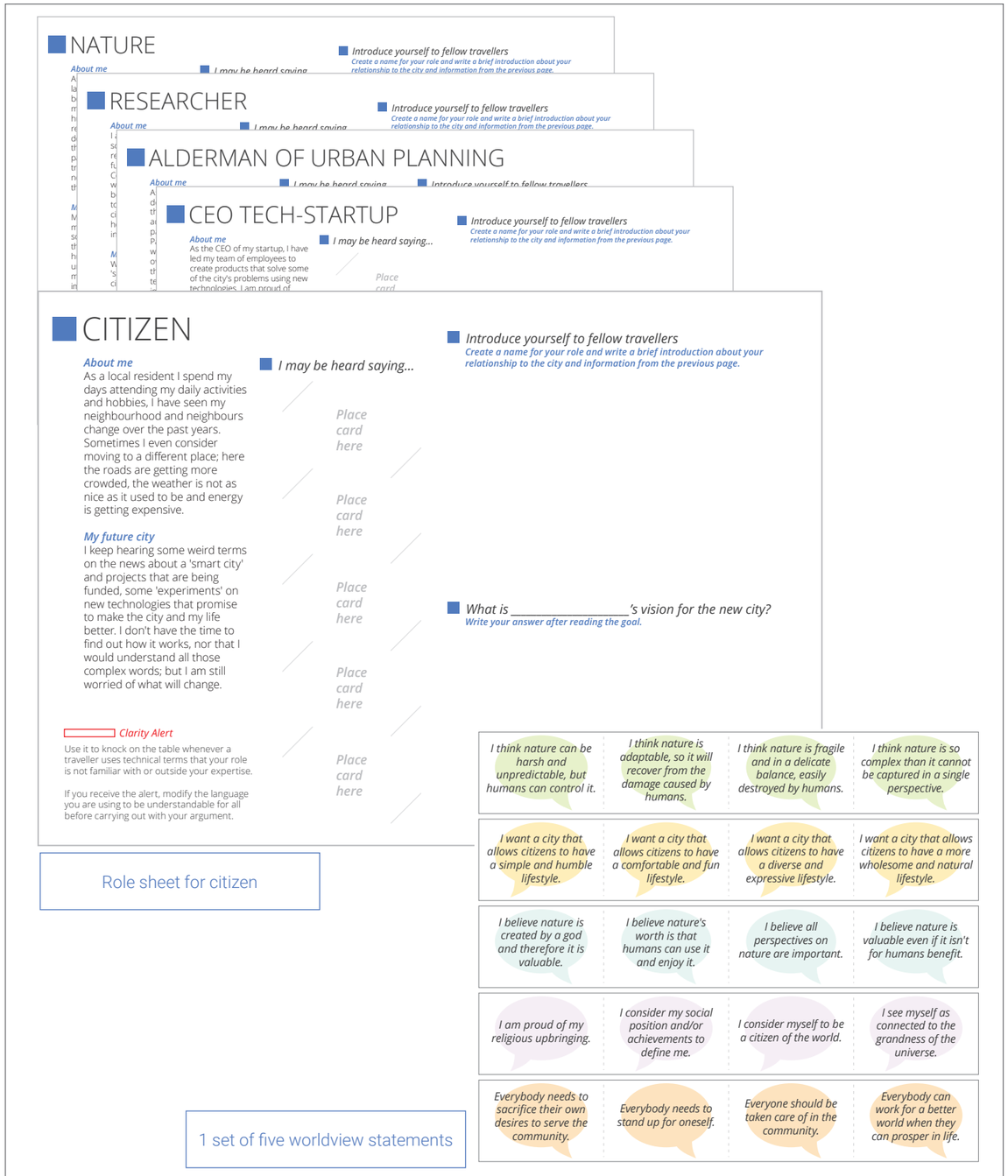


FIGURE 18. Visualisation of Role sheets. Detail for Citizen role are shown as an overview along with worldviews statements.

Clarify alert

1 per player

As identified in the thematic analysis, discussions about technology for the city frequently make use of technical terminology or domain specific terms that hinder those unacquainted with these concepts. To start addressing this situation, the clarity alert was created for the game as a tangible representation of the message 'I do not understand what you are talking about, could you clarify it for me?'. As shown on the Role sheet, this wooden token (Figure 19) is given to each player to be used whenever a player uses a technical term, or language, their role or themselves are not familiar with. The token is meant to be knocked on the table, and when used, the speaking player needs to reconsider their choice of words to make their argument understandable for all roles. This alert can be used at any time during the game, by any player, and as many times as necessary.

FIGURE 19. Visualisation of Clarity alert, a red wooden piece given to each player.

In-game goals

3 goals: Mobility, Energy, and Climate

Three different in-game goals were developed based on current environmental challenges in the Netherlands: mobility, energy and climate (Figure 20). Informed by the work of different Dutch organisations addressing these wicked problems, the three goals contain a brief background description and the framed challenge for the game. Depending on the context where the game is played, these goals can be readjusted or if necessary, a new one can be created with consideration of the language used and the frame for the challenge.

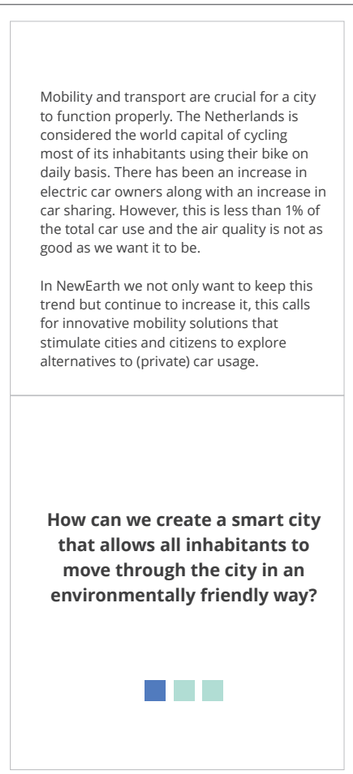


FIGURE 20. Visualisation of in-game goal, Mobility.

Boards & Letters

4 boards with matching letters

The game goes across different phases, four of which are complemented by their own board and letter: (1) Pack, (2) Discover, (3) Reduce, and (4) Build. In each phase, players need to complete a series of tasks (Table 11) as they embark on their journey towards NewEarth. In Figure 21, the letter for the Pack phase is shown, the Pack board is shown in Figure 22. Moreover, in Table 12, the value discussion of each phase is described.

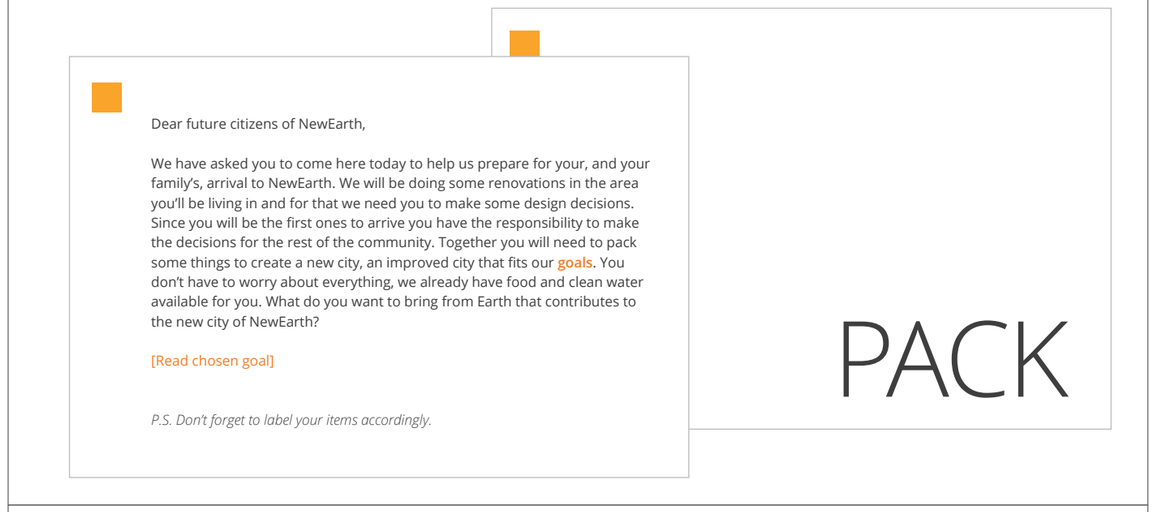


FIGURE 21. Visualisation of letter for Pack phase.

Game phase	*General task description*
Pack	Worldviews, instead of specific values, are made explicit in the decisions players make of what they consider as (not) contributing to address the environmental challenge; these are considered ***Earth resources*** tokens. The moderator supports this reflection with questions based on Rawluk et al. 's (2019) framework in order to move from valued objects towards the individual value reflected in the chosen token. As the rounds progress, players can identify what other players find valuable to have in their new city and why; which might be similar or drastically different to their perspective. This phase further aligns with Horcea-Milcu et al. 's (2019) Perspective 1, by surfacing the diversity of value systems.
Discover	Through non-technical language, three different technologies are presented that are currently used in smart cities as ***Tech-resources*** (see Section 2). This phase focuses on letting players understand what these resources can offer, how they can contribute to their in-game goal and how they may affect their values; thus leading to emerging value tensions and a negotiation of their values regarding technology (Perspective 2). As aimed by VSD, the interaction between technology and society is explicitly started in this phase.
Reduce	Values are further approached in line with Perspective 1 and 2 (Horcea-Milcu et al., 2019). First, as each player needs to make explicit which resource from another player they would like to discard, and second, as they negotiate which ones should be brought back. Controversies may emerge in this phase within the group, which they will have to address by negotiating a solution that satisfies the group.
Build	At this point of the game, the resources selected have defined the solution space and the supported values. As players start pitching the products, services and infrastructure for the smart city, further negotiation of values and emerging controversies will need to be addressed. Every intervention is discussed whether players agree it should be in their new city. Additionally, technology needs to be framed according to the group's values by what they consider acceptable to interact with.

TABLE 12. Overview of value discussions in NewEarth.

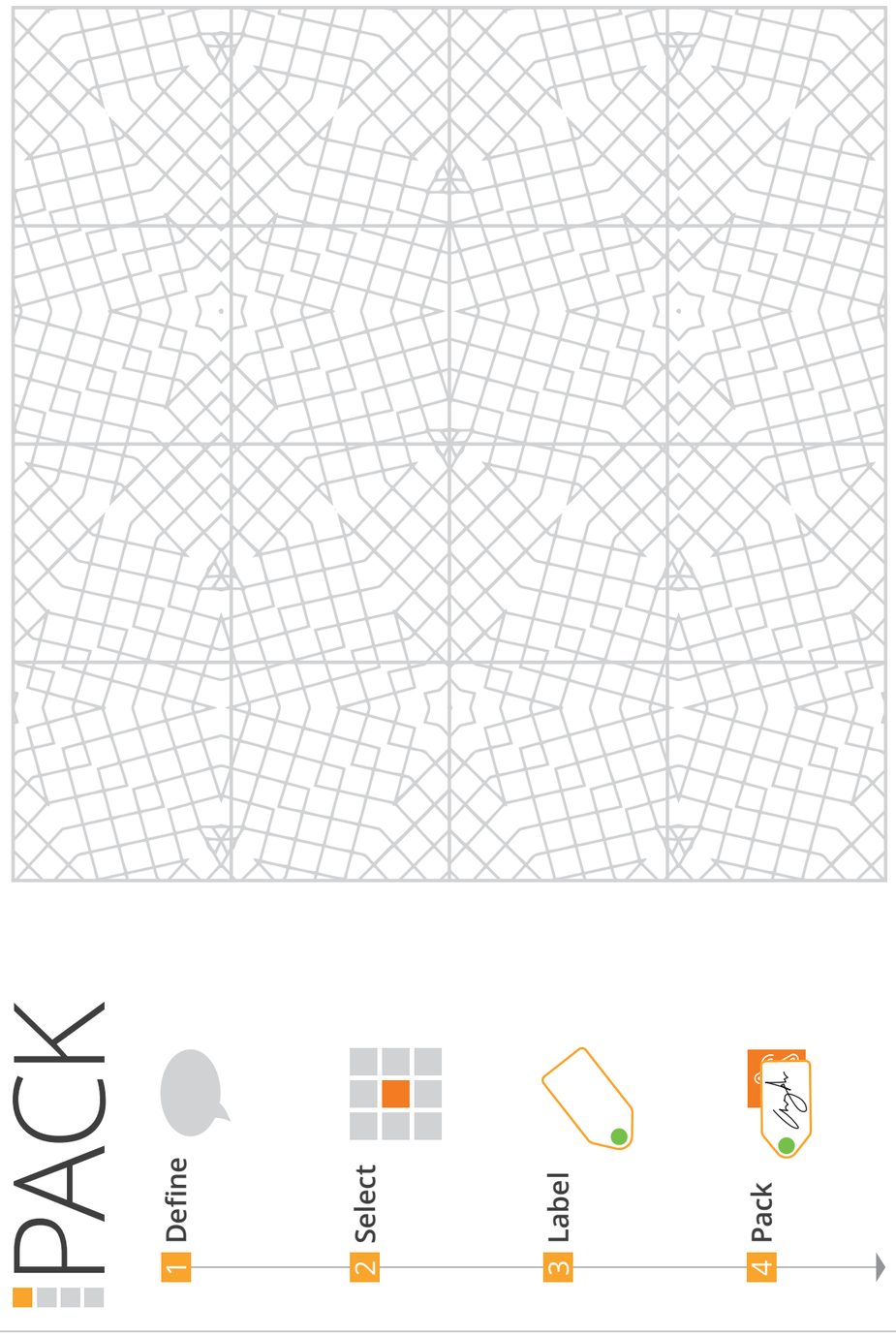


FIGURE 22. Visualisation of board for Pack phase.

Earth resources

42 tokens

These wooden cubes include an icon on its sides (Figure 23), these are open to interpretation to allow players to define them according to their worldview. Each cube, defined during the Pack phase, makes tangible the player's perceptions of what products, services, and/or infrastructure can (1) contribute to address the environmental challenge, and (2) which ones are worsening the situation but can be reframed to contribute to a solution.

As the game carries on, each token goes from being identified by its icon to the player's definition written on a paper label and then attached to the token. The laddering questions, based on Rawluk et al. (2019), take the player from identifying the product, service and/or infrastructure towards identifying what they find valuable in it from their role's perspective.

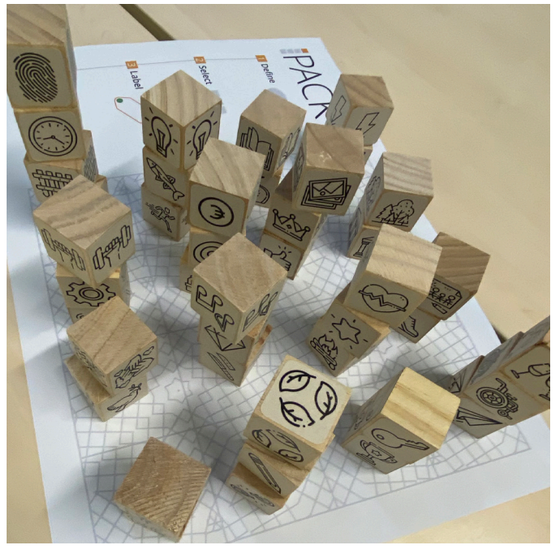


FIGURE 23. Visualisation of Earth resource tokens in Pack boards.

Tech-resources

45 tokens and 15 cards

These white wooden cubes can be found with three different icons and accompanied by a description card (Figure 24). Each icon represents a different kind of technology used in smart cities. **Sensors** are translated to ***measure***, **autonomous systems** to ***perform***, and **Internet of Things** to ***share.*** During the Discover phase, players need to discuss how these tech-resources can contribute to their vision of the city and the in-game goal.

The corresponding accompanying cards include two sections of information for the players using non-technical language. First, an overall description of the technology's possible functions and applications, and second, a fill-in section of how the technology will operate in the final design of the city.

FIGURE 24. Visualisation of tech resource *Measure* and corresponding card.

Resource container

1 container with designated places

The resource container is the space where both Earth and Tech resources are collected during the game, the space is distributed to store up to 5 Earth resources and at least 2 Tech-resources per player (Figure 25). Each player has the same space available despite their role or amount of players; a democratic distribution of space. With 5 or 6 players, the rows without a player must remain empty throughout the game. This container serves as the representation of the players' framed solution space and individually supported values.

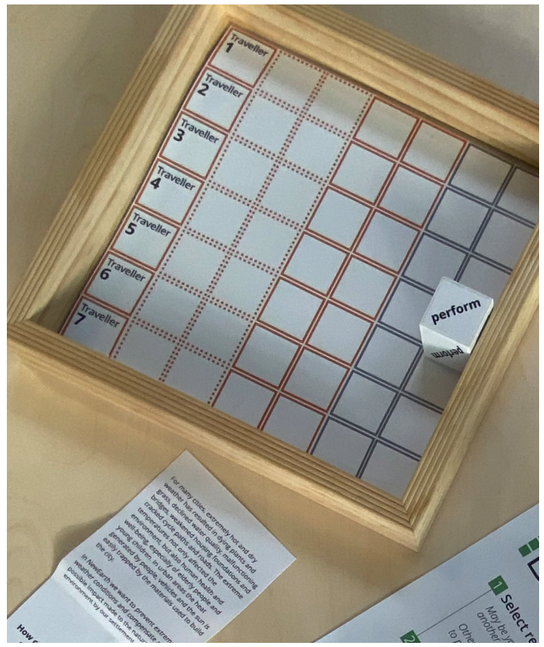


FIGURE 25. Visualisation of resource container after Pack.

Voting ballots

1 ballot per player

To identify whether the game goal was met, a voting round is made to determine if from their individual perspectives they have created a smart city that meets the in-game goal where the players' roles want to live. On a two-sided ballot (Figure 26), each player decides between yes/no option and further elaborate on the reason for their decision (e.g. Yes, because…). Their answers are further discussed in the final group discussion.

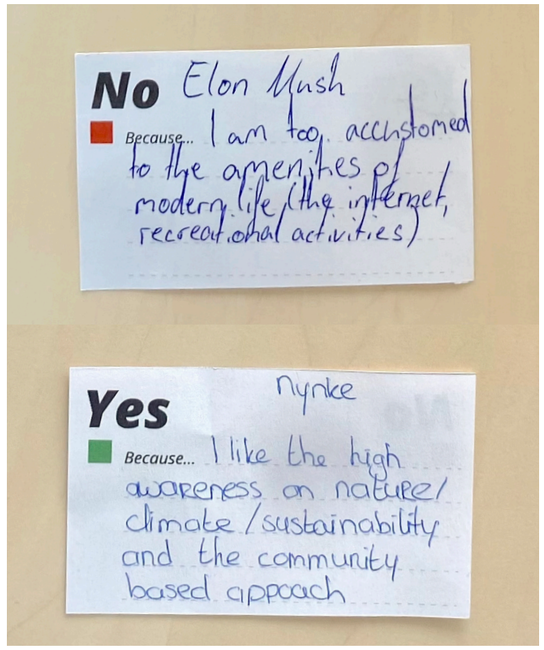


FIGURE 26. Visualisation of voting ballot.

Additional materials

Some store-bought materials are further needed for the game however these do not need to be adapted for the game, such as name tags, pens, adhesive tape, and paper labels.

Overview of all components

In Figure 27, all components in NewEarth are presented.

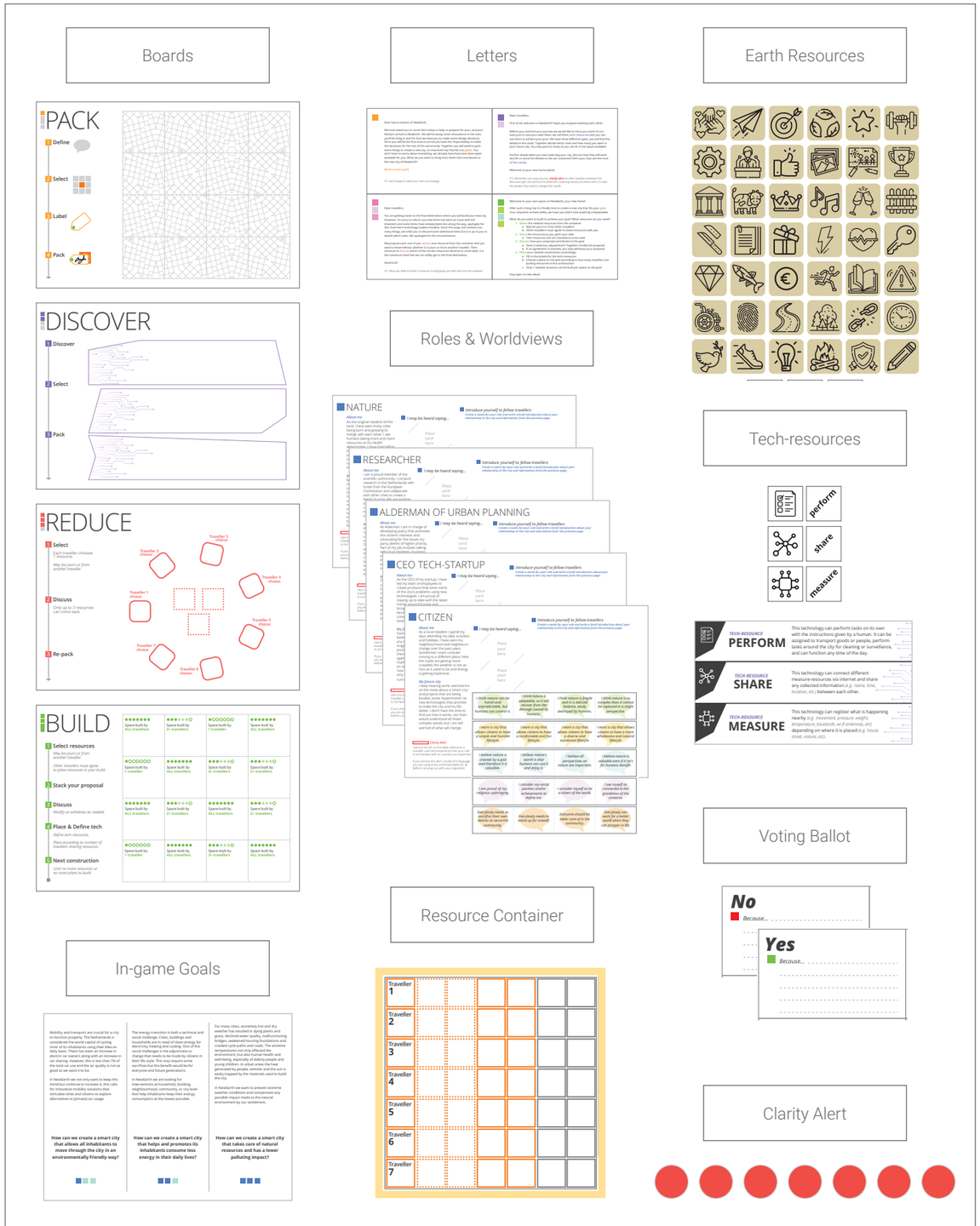


FIGURE 27. Visualisation of all game components in NewEarth.

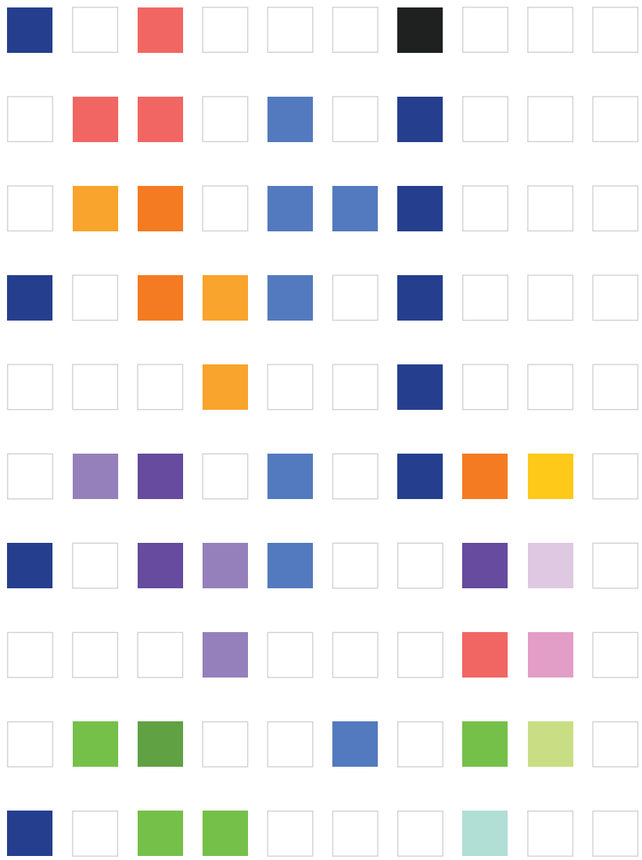
6.4 Gameplay

To understand how the different components interact and the interventions from the moderator, a description of the gameplay will be presented according to the game structure in Table 13.

Phase and components	*Moderator actions*	*Player actions*
Intro Role sheets Worldview sets Clarity alert Name tags Pens	1. Present the story of the game and overview of phases. 2. Give players materials for creating roles. 3. Make a round of role introductions. 4. Present goal options, players vote on which goal to work for.	- From the worldview set, select the statement of each paper strip that you would like for your role and fill in the Role sheet. - Read the goal aloud. Complete your Role sheet with your vision of the city based on the chosen goal.
Pack Pack letter Pack board Earth resources Container Paper labels Tape	5. Setup materials: stack Earth resources on board area at random. - 7. Explain steps and clarify doubts. 8. Guide packing rounds: [Round 1 and 2] What would you bring from Earth that contributes to the goal? How does it contribute to addressing the challenge? Is that important for (role's name)? [Round 3 and 4] From the factors contributing to this problem, which one would you modify so that it contributes to the solution? [Round 5] Players can choose what kind of resource to pack.	- 6. Read letter aloud. - Pack a resource: *1. Define:* one at a time, take turns answering questions. *2. Select* a token that represents your answer. *3. Label* your token by writing down your answer. [Round 3,4] Write down in red label, and redesign in green label. *4. Pack* your token in the container, in your corresponding space
Break	9. Review chosen resources, choose 3 to discard in the next phase by (a) unrelated resources to discussion OR (b) choose at random. Do not remove them yet.	-
Discover Discover letter Discover board Tech-resources tokens and cards	10. Setup materials: place tech-resources and labels on board area. - 12. Explain steps and clarify doubts: There are no more tech-resources, pack as many as they can fit, keep tech-cards with you, no penalty for unused resources 13. Keep track of time	- 11. Read letter aloud. - Discover tech-resources: *1. Discover:* read through the tech-cards *2. Select:* as a group, decide which ones and how many tech-resources can be useful for your future city *3. Pack:* place chosen resources in container
Reduce Reduce letter Reduce board	14. Setup materials: place board. 15. Remove the 3 resources identified during the break 16. Explain steps and clarify doubts: Every player MUST choose one resource, UP TO 3 resources can come back 17. Keep track of time	- Read letter aloud. - Reduce resources: *1. Select:* every player chooses 1 resource to discard, their own or other's *2. Discuss:* negotiate which ones deserve to come back, maximum 3 tokens can return *3. Re-pack:* place chosen resources in container
Build Build letter Build board	18. Setup materials: place board. - 20. Explain steps by providing an example of what is possible to build. 21. Guide discussion in the beginning: What do you want to build in this new city that will help achieve your goal? You have discussed some during the game and may have thought of some in your initial vision (in Role sheet)	- 19. Read letter aloud. - Build the new city: *1. Select:* choose which resource tokens you need to build your proposal Example: I propose to build an oil refinery because that will create fuel for cars, so I'll build it in a [forest] and use [machines] for the production and use [tech-resources] to make it efficient *2. Stack:* place tokens in a tower Example: player stack the three chosen resources *3. Discuss:* as a group, discuss whether the proposal is approved, if still need changes or is rejected Example: do we agree? / No, I packed [forest] but not for this so no, you cannot use my resource *4. Place & define:* choose a place in the grid that fits your build and define the details for any tech-resource used *5. Next build:* continue building as long as you want or until resources are all used
Break		
End of game Voting ballot	22. Voting: On behalf of NewEarth, thank you for all your effort to create this new city. Before you can go into your new life in this city, do you think you have achieved a city that… [read goal] where you want to live in? / Give players voting ballots 23. One at a time, players reveal answer 24. Give results: UNANIMOUS YES: Congratulations! MIXED RESULTS: I'm sorry to tell you that you have not completed the mission successfully. 25. Start debriefing: - What did everyone write down? - As we step out of our roles, how did you feel with your roles? - What could you have done to achieve a different result? - What did you learn about collaborating with stakeholders from different backgrounds? - What can you take from this experience for future collaborations?	Write down answer in voting ballot Share answer - Join discussion

TABLE 13. Overview of gameplay of NewEarth.

7 PLAYTESTING



The following section presents the approach for playtesting the game. First, the approach for playtesting is presented to primarily focus on the world of Play. Second, the results of the game are described according to the defined phases for the playtest session: introduction, game phases, and end of the game. Third, two game goals are discussed, both game goal and meta goal. Lastly, from the playtest session it can be concluded that *NewEarth* allowed players to collectively construct meanings as they co-create a smart city informed by their worldviews.

7.1 Approach

Session goal

A session to test the game design (world of Play), with all its phases and components, can provide insight into the goals of the design. As previously presented, NewEarth has the goal to create a levelled knowledge field where to discuss smart cities. For the game design, the goal is to co-create a city that fits the in-game goal (e.g. mobility) where players want to live. Moreover, the results from testing the design can further inform the research questions of this thesis.

Participants

The session was planned for 7 players to attend, which represents the maximum number of players. As aforementioned, the varying number of players modifies the number of participants playing the roles of the citizen which ranges from 1 to 3, thus 3 of them will be taking the role of a citizen. Additionally, the author of this thesis would act as the moderator of the game.

Time allocation

Informed by the previous playtest session (Chapter 5), estimations of times were given to each phase of the game along with breaks in between as the estimated total play time is 3 hours. The allocated times can be seen in Table 14. Materials and components of the game will be used as presented in Chapter 6, with players choosing their role at random and voting for the Smart City Goal they want to achieve.

Data collection

For further reflection and discussion of the session, data was collected through observations and notes. The author of this thesis acted as game moderator during the session, thus after the session notes were written down. These notes were further structured and inform the following section.

7.2 Results

Setup

For this session, the game was played with students from a university in the Netherlands and a university lecturer. Each with different academic backgrounds who have collaborated previously and are knowledgeable on the topic of transdisciplinarity. Even though they do not cover the target audience for the game in its entirety, playtesting the game with these participants has provided valuable information for the further development of this project. These are discussed in the Discussion section of this chapter.

Duration	*Playtest session*	*Game phase*
10 min	**Introduction**	Introduction to game and components
15 min		Role creation and goal selection
5 min		Role introductions
40 min	**Game Phases**	Pack
10 min		*Break*
7 min		Discover
7 min		Reduce
40 min		Build
10 min		*Break*
5 min	**End of game**	Voting
25 min		Debriefing

TABLE 14. Overview of time allocation for each section of the playtest session.

The time allocated for each section was sufficient for some of the activities, however for sections involving extended discussions such as Pack or Build the time was extended to take all necessary turns and actions. Phases such as Discover and Reduce were timed to keep the discussion focused and not delay the schedule more. Due to these modifications, the second break was skipped and the session moved into the final reflection.

Introduction

Worldview descriptions allowed players to reflect on their values and share them under the protection of a role. The five worldview descriptions could be as similar or as distant from themselves and it was not necessary to disclose the approach taken by the player. Through a majority of votes participants selected the goal of 'Climate' as the main framer for their new city. In comparison with the previous playtest session, the added question to write down their personal vision of the city (see Figure 28) allowed them to start framing solutions that would fit their chosen values; a starting point for the following game phases.

Game phases

Throughout the phases, players were able to explicitly share the decisions made and how these were contributing to the in-game goal. Every role had to voice their values in various ways such as which resources they deemed relevant to pack and how these would later be implemented in the new city (Figure 29). Moreover, which tech-resources they deemed necessary and relevant for their somewhat shared vision. Further, make explicit which proposals they didn't agree with and negotiate as they reframed the proposal.

As for the components of the game, some of the descriptions caused confusion among players which had to be further explained by the moderator. An example of this situation are tech-resources where the player's confusion was greater than expected on what these meant and how they would work later on. After providing an explanation and the possibilities for using tech-resources, players took a cautious approach to only pack what they considered would be useful even when there was no consequence for packing a surplus.

End of game

Voting takes place at the end of the BUILD phase once players have no more resources or plans to build any additional space. Players were asked to reflect on their work and the values of their roles by casting their final vote: *Have you created a city that meets the goal where you would like to live in?* (See Figure 30). Based on the voting results, players were not able to meet the winning conditions of the game since there was no unanimous positive agreement. Even though they attempted to negotiate and accommodate the diversity of interests, they did not engage with all emerging

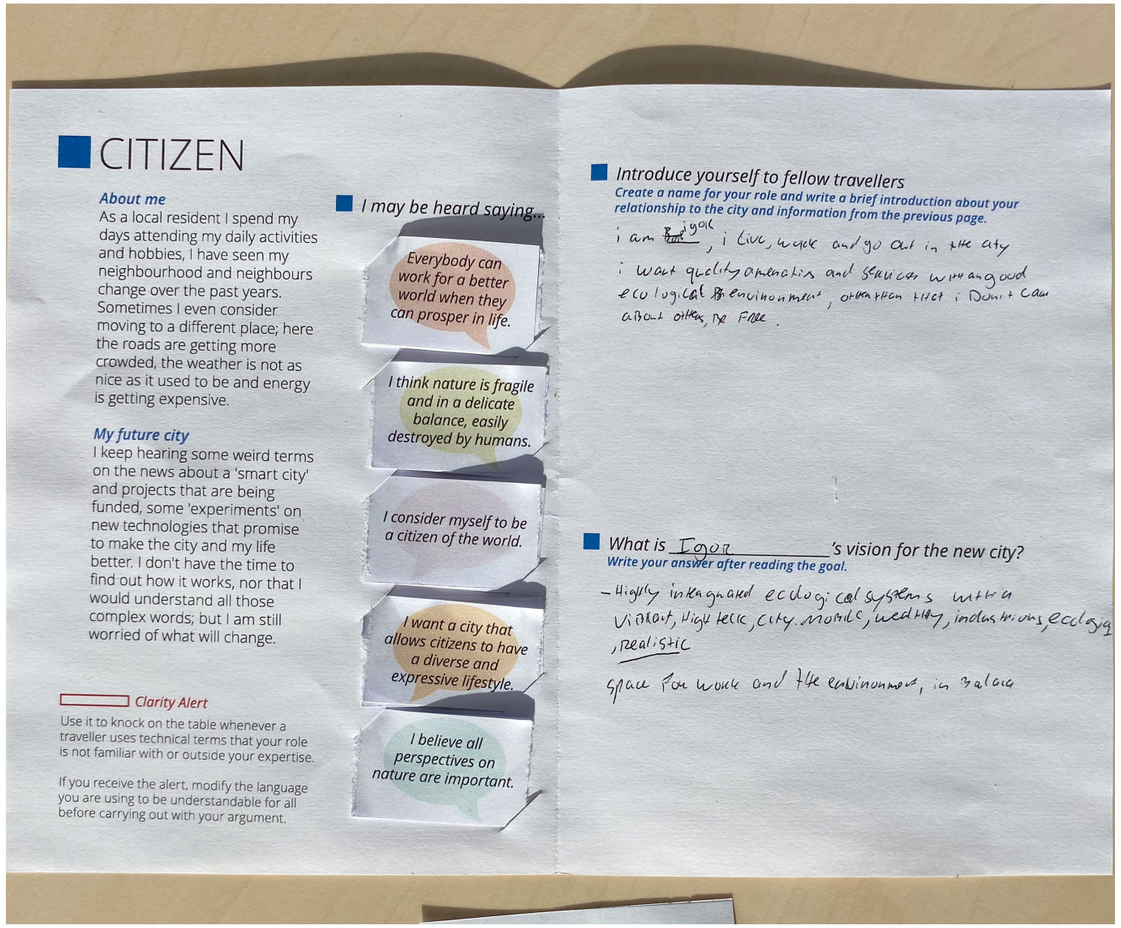


FIGURE 28. Material from playtest session, Role sheet filled in.

FIGURE 29. Material from playtest session. Left: chosen resources by players, each row belongs to one player. Right: co-created city using both Earth's resources and detailed tech-resources

conflicts and decided to focus on the ones that aligned with an outcome favourable to them. Even though there was a collaborative process towards building the city, some of the players did not consider the city reflected their values.

Debriefing was the only section that had not been previously tested due to the over extended playing times. The discussion was started from the voting results with every player sharing their answers. Players who did not feel reflected in the city commented their contributions were being ignored as they did not fit with the majority's vision at multiple points of the game or that this new city did not align with their lifestyle. Those who felt their values supported by the city considered the city to be a desirable place to live in considering the goal and the technology implemented. Regarding the roles played, most players considered them easy to portray as they were ideologically close to their own thinking and their role's interests could be easily advocated for. The players who created a role diverging from their own beliefs mentioned they chose to take their role towards an increasing 'opposing' path as the group started to ignore their perspective along the game. Even though they would personally agree with what the new city represented. When reflecting on multi-stakeholder collaboration, the group pointed out how easy it became to ignore someone's opinion when they had enough support from other players. Furthermore, they highlighted the importance of being aware of this issue so it can be addressed in future collaborations where the opinions of everyone at the table should be given equal attention and importance.

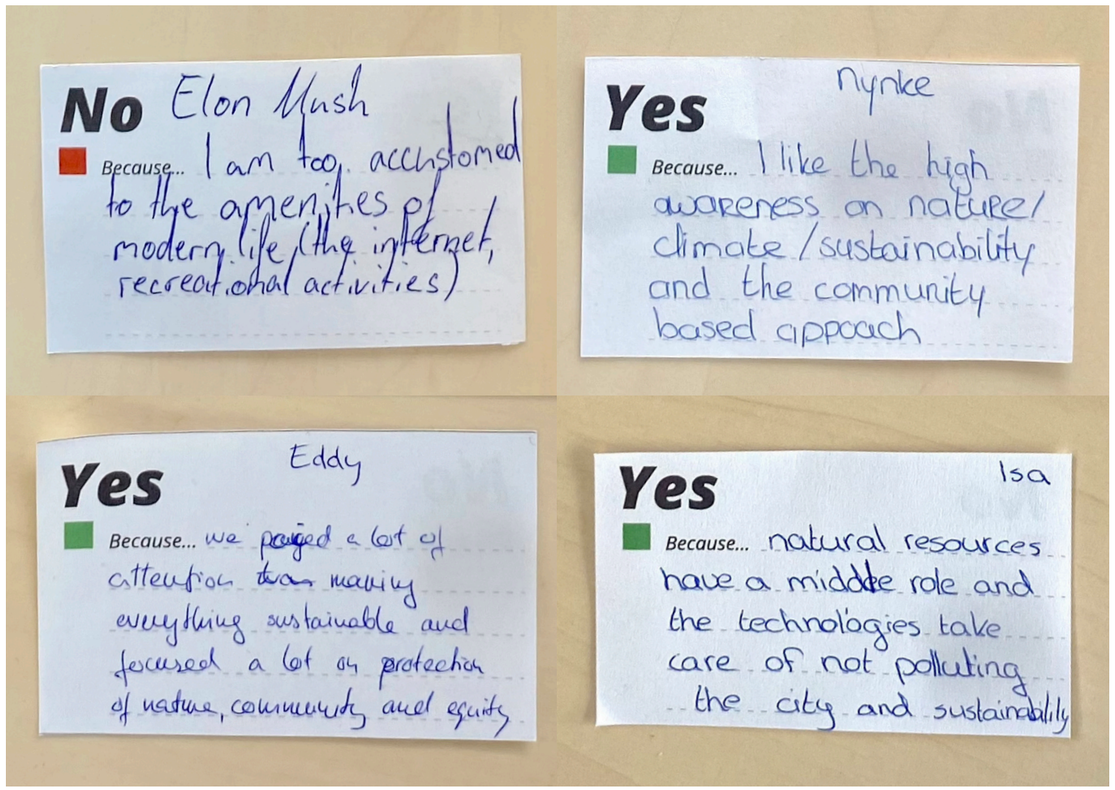


FIGURE 30. Material from playtest session, samples of voting results.

7.3 Discussion

It is important to note that this test was performed in an artificial setting, given that none of the players fully represents the target audience. The game is intended for practitioners and stakeholders involved in the field of smart cities. However, trying out the game with non-experts in the field offered valuable insights into the game design aspects of NewEarth. These are discussed below.

Game goal: Co-create a city that fits the in-game goal where you want to live in

The gameplay allowed players to reflect on what their roles considered a desirable place to live in. First, by selecting their role's worldview in the Role sheet and writing down the city they envisioned. Moreover, players identified what is valuable for them, from concrete objects towards abstract concepts. The co-creation process involved negotiating the values that, as a group, they wanted to promote in their new city. For each building proposal they made, they had to reframe their approach to fit more others' worldviews when necessary. Though not every proposal was unanimously accepted, it was accepted by those sharing resources.

The collaborative process between players further included socially constructing meanings. Their understanding of the factors contributing to the problem and the solution (Earth resources) was socially constructed. As the wooden cubes were selected, players attributed a meaning from their role's perspective. This led, on occasions, to other players sharing what other meaning they intended to give the same cube. In these occasions players opted for another cube, their decision was accompanied by explaining how this new symbol was still representative of their message.

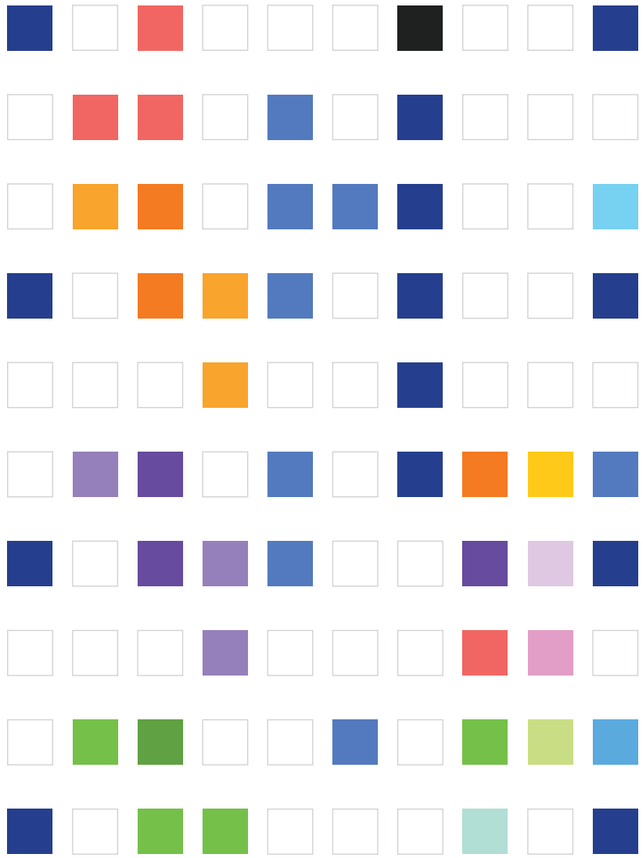
Meta goal: Create a levelled knowledge field to discuss smart cities

To maintain the discussion within understandable and clear terms players made use of the Clarity Alert. The main intention of this mechanic was to prevent other players from using technical jargon that was not understandable by the role or the player behind the role. For this purpose players used the alert mainly in the first phase to further understand what other players were packing with questions such as "what kind of roads?". The same mechanic was eventually used to ask players to be more specific and detailed on their choices with questions such as "What is sustainable?", an unexpected use of this mechanic. Meanings began to be socially constructed. As the game moved forward, players started to bring technical terminology into the discussions which they all seem to understand and the use of the Clarity Alert diminished. By the final phase of the game, players had become accustomed to ask for clarifications and further details on the ideas other players were proposing without the need to use the alert. When defining the details for the tech-resources, the discussion stayed within understandable terms (no use of alert) with a greater focus on how comfortable they felt with the technologies or whether they considered their values at risk. The openness to interpretation of unlabelled blocks paired with the actions enabled by the tangible qualities of the clarity alert, allowed players to collaborate while controlling the terminology used when discussing technology.

7.4 Conclusion

This session has provided insight into how the world of Play is supporting the goals of the game NewEarth. The game mechanics allow players to co-create a smart city by traversing the different phases and engaging with controversies along the way. The co-creation process is further supported by game components that allow players to socially construct meanings and a shared language.
In conclusion, the game design of NewEarth supports a discussion space that pays attention to the multitude of values and the mediating role of language.

8 CONCLUSION



The following chapter analyses the results of the research process presented in this thesis. First, the three research sub questions from the theoretical lens are discussed to address the main RQ. *How can Systemic Design and Dilemma Thinking support a value-sensitive (re)framing process within a smart city multi-stakeholder collaboration through a tangible representation?* Second, the main contribution of this thesis, supported by the design of NewEarth, is presented. Third, the limitations of this thesis are discussed followed by recommendations for future work. The discussed recommendations are in regards to two areas, further evaluation and design modifications. Lastly, the conclusions for research and the design outcome are presented.

8.1 Answers to research questions

This research process explored multi-stakeholder collaboration incorporating both a theoretical approach informed by different fields and findings about the current practice from the perspective of different practitioners. Both theory and practice provided insights into the socio-technical context of smart cities; a complex, interconnected and multi-layered transition towards a more sustainable future. Through multiple collaborative efforts, the Netherlands has started to take a participatory approach for the technological redesign of their cities. However, these have yet to go one step further in their strategies and plans for citizen involvement; such as through transdisciplinary research.

Prior to discussing how the design outcome of this thesis addresses the main research question, the research sub questions will be discussed.

(RQ.T1) How can value sensitive design inform the (re)framing process among stakeholders in smart city collaborations?

By starting from a value sensitive design perspective (Friedman & Hendry, 2019), the approach was to inform this thesis' design process by considering human values along the way. Though this meant deciding which human values would be prioritised during the design process; whether they came from the designer, the stakeholder, or the practitioner. Even though this can be an insightful reflective exercise for any individual, 'what is important to us' remains challenging to define and seems almost impossible to find a single word that can encompass the complexity of fluctuating human beliefs. Because of this, during the literature research (Chapter 2), the project was complemented with additional theoretical perspectives to further understand and address the issue. Worldviews (De Witt et al., 2016) offered to this project a less constrained approach to identify, and reflect on, what we value in our lives, in our urban surroundings, and the planet we live in. Further complemented by other researchers working on understanding how research interacts with values (Horcea-Milcu et al., 2019), how one's values interact with others' (Matos Castaño et al., 2020; Ozkaramanli, 2021), and how we can embrace the emerging conflict between them (Grönvall et al., 2016; Matos Castaño et al., 2020). These theoretical inputs changed this project's perspective on values. ***Rather than designing from them, the aim became to work with them and towards their discovery.***

A way for values to inform the framing process lies in the understanding that values frame our reality. Our worldviews are framing how we approach complex societal challenges, and this individual understanding of 'what is important' is what ends up influencing the project frame. It is not only an interconnected network of human and non-human actors defining how we should be addressing environmental challenges, but also our own understanding of 'how' and 'why' we decide to transform our cities.

Value sensitive design provided an insightful starting point to reflect on what we each bring to the design table. Transdisciplinary research has started to recognise how values can promote collaborative ways of working (Horcea-Milcu et al., 2022). Thus, making our worldviews explicit within a collaborative setup is not only important, but essential to align visions in such long-term projects. Important to note that the diversity of perspectives should be embraced rather than aspiring to share the same belief system.

The conflict that resides in the multitude of perspectives needs to be considered as a source for innovation, as a new meaning to be discovered, and as an opportunity to reframe. As framing processes adopt an evolutionary approach (Bijl-Brouwer & Malcolm, 2020); our understanding of what technology can, and should, do for our cities also needs to evolve.

(RQ.T2) How can Systemic Design and Dilemma Thinking support the discussion of implicit values present in smart city collaborations?

Systemic Design (Bijl-Brouwer, 2019) has offered a wider lens to approach any research question. The systemic perspective to reflect on the multi-layered impact of design interventions has highly influenced this thesis and its approach to technology discussion in two main ways. First, by creating a space in design to redefine, constantly, how wicked challenges are understood and addressed. Second, by proposing principles (Bijl-Brouwer & Malcolm, 2020) that have provided a way to understand that systems are to be intervened in an iterative way by embracing their complexity. Thus, allowing design practices to embrace the malleability of what we identify 'inside' the system's frame and what we 'take from it' to intervene in the urban context.

Dilemma Thinking complemented by Systemic Design, allowed for the analysis of the multitude of perspectives, and worldviews, that would often be at conflict in such societal challenges. In current practice, these opposing values are often ignored or avoided out of fear of how they may affect the planned pathway of the collaboration. Engaging with these networks of values entangled with technological development, allows us to identify and reflect on the different elements at risk in the irresponsible use of technology. Exploring the socio-technical context as a system of conflicts showed the creative potential that lies in controversies.

The discussion of implicit values in NewEarth is informed by both fields and mainly guided by the principle of 'developing empathy with the system' (Bijl-Brouwer & Malcolm, 2020). By not only addressing the sociotechnical system of smart cities but also the network of interconnected values brought by the players' roles. As the value network forms during the game (resources being labelled), the value tensions start to emerge (displayed in the resource container). These multi level controversies are addressed from an agonistic approach in which the fictional setting of the game allows players to negotiate their perspectives to achieve a decision. Thus, placing players as constructive adversaries with individual worldviews that aim at the same greater goal. Disentangling the controversies already present in our cities, in the design of technology, and in the intersection of both, offer a moment to reflect on the living systems that we have built so far before deciding in which direction to keep building.

(RQ.T3) How can the discussion of implicit values be supported by a tangible representation?

The theoretical approach taken from Embodied Cognition (van Dijk et al., 2014) was gradually linked to an exploration of controversies through thinging (Grönvall et al., 2016). Both approaches have enabled the exploration of how meaning is collectively constructed in socially situated practices. Mediated by the potential of a tangible representation, a productive discussion can take place on 'delicate' subjects such as making values explicit and negotiating them.

Within this thesis, tangible representations have contributed to value discussions on three levels. First, they supported the individual process towards gaining an understanding of our own, and others', worldview. This can be considered a relational learning outcome (Baird et al., 2014). Second, representations scaffolded the design process within NewEarth as players experimented with their own approach to collaboration. Third, the physicality of the game nurtured the understanding of systemic challenges by representing the problem and solution frames. These frames were co-created by the players as they attributed meaning to the components within the game.

Serious games presented an opportunity to integrate the identified characteristics for value discussions in a situated practice. NewEarth has explored the balance within the worlds of Triadic Game Design (Harteveld, 2011) in analog negotiation games. Reality did not aim for a detailed replication of cities or urban design, it was more important for players to bring in their own interpretations of what cities can offer. Meaning was focused on the relational learning outcome for players by allowing them to make their worldviews explicit and negotiating their way through dilemmas. Play created a fictional setting to create a safe space where players could express their values protected by the roles they created.

The possibility of games to support value discussions has been explored in other projects such as The Moral Design Game (van der Vorst, 2022) and Future Frictions (Future Frictions, 2021). These are supporting value discussions on existent smart city interventions at later stages of collaborations. However, in this thesis NewEarth focused on supporting a different type of value discussion. NewEarth addresses the implicit values at early stages when stakeholders are setting up the collaboration and will start framing the urban challenge. Nonetheless, all three games present a space to reflect on the ethical implications of technology and how it affects both the city and its citizens.

8.2 Contribution

Throughout this thesis knowledge from different fields and practices has been explored to support value discussions that resulted in the serious game NewEarth. Below, the main contribution of this thesis is discussed.

The serious game *NewEarth*, as a collaboration tool, can support a productive discussion of controversies that nurture smart city collaboration teams in their understanding of each other and the challenge.

The possibility of games to create roles and immerse players in a fictional setting has proved beneficial to discuss values. NewEarth has avoided defining and listing values since this places a predefined frame on the discussion rather than allowing the discovery of these. However, using worldviews (De Witt et al., 2016) to build roles has allowed for a reflection on how said statements relate the most, or the least, to one's value system. Thus, allowing the players of NewEarth to reflect on the different perspectives one may have about smart cities. In the game players can discover perspectives on what others' value (Horcea-Milcu et al., 2022) and their understanding of the challenge (Lang et al., 2012), both forms of relational learning (Baird et al., 2014). Moreover, collaborating requires understanding each other in terms of the language used, especially for technical terminology used to discuss smart cities. Leaving this communication barrier unaddressed can hinder the collaboration (Lang et al., 2012). NewEarth addresses this barrier by allowing players to reflect on the language differences through an embodied approach through its physical components. Therefore, NewEarth can mediate a productive discussion of smart city technologies that pays attention to the interconnected multitude of values and the mediating role of language.

8.3 Research limitations and future work

The work in this thesis has led to the development of the serious game NewEarth, however there are two limitations that need to be addressed in future work. First, the game has only been evaluated once, and second, it involved participants who do not fully represent the target audience; an artificial setting. As previously discussed in Chapter 7, participants did possess different backgrounds, but had already collaborated together and were knowledgeable on the topic of transdisciplinarity. Thus, a further evaluation of the game with the target audience is recommended to gain insights for a following iteration of the game. In the context of evaluating the game further, the following three recommendations are given:

Evaluating NewEarth in a smart city collaboration. Playing NewEarth with the intended target audience can provide further insight into the game experience and value

discussions. Bringing together different practitioners and stakeholders to play can nurture the evaluation of the game experience. Moreover, having academic and non-academic players can highlight new areas of improvement for supporting value discussions. This evaluation can be further complemented by the second and third recommendations of this thesis, presented below.

Evaluating the levelled knowledge field. By testing the game with a diversity of practitioners and citizens, the difference in tech-savviness may be further highlighted. Thus, it presents the opportunity to analyse if the current game design is enough to deal with greater differences in technical language. This player setup would allow evaluating components such as the impact of the 'clarity alert' and whether the language used in the game components is understandable for all players.

Evaluating learning outcomes. Evaluating the game with collaborators at Phase 0 (Horcea-Milcu et al., 2022) and/or Phase A (Lang et al., 2012) in their work, can further inform the relational learning outcomes of the game. This line of research would need to consider how to approach multiple game sessions to better evaluate learning outcomes. Especially, due to the long term duration of smart city collaborations in which the value network would evolve as stakeholders gain a further understanding of others' worldviews and the challenge itself.

Even though the current evaluation of the game was done in an artificial setting on one occasion, it has highlighted areas of improvement for the next design iteration. The following three design recommendations focus on improving the overall game experience based on the observations made during the playtest session (Chapter 7).

Redesigning elements of Pack and Build. For the board of the Pack phase, the steps described on the left side can be revised. Currently this section presents the steps players need to take in their turn. However, part of these steps are taken by the moderator and may not be as important to be displayed. This space may be better used by presenting the questions players need to answer on each round of this phase. For the players' experience, turn taking can be revised to balance the benefit of always being the first to pack resources even as the questions change. Adding a game mechanic to address this should be further explored. Furthermore, the amount of Earth resources and their icons can further be revised. Adding more resources can nurture the discussion as it presents more possibilities of items to pack, and more meanings that can be socially constructed.

As for the Build board, the content included can be revised to reduce the amount of information both in instructions and in the building grid. As in the Pack board, instructions can be reduced as the moderator supports players in understanding the building process. A redesign of the building grid can be explored to display more clearly the building limitations. Moreover, the building grid can be reconsidered to focus on the players' worldview agreement to each proposal instead of the amount of players sharing resources. Important to note that altering phases may require adjustments in other components of the game.

Redesigning debriefing structure. Given the importance of this phase to reach learning from the play experience, further revisions should be made. The current structure has shown to be insightful for players with experience in transdisciplinary working. However, playing the game with its target audience may require a revision of the questionnaire that adapts to the stage the collaboration is at.

Redesigning allocated times. The proposed time for each phase of the game has shown not to be sufficient. It would be necessary to reconsider how to distribute time along the different phases. Alternatively, the game duration can be extended over 3 hours with adjusted break times. More time to play would allow addressing each phase with more attention to support the learning outcomes of the game. However, this would also demand a greater effort from players to remain in their role.

8.4 Conclusion

This dissertation aimed to provide an understanding, through theory and practice, of how smart cities are being framed at the beginning of multi-stakeholder collaborations. The theoretical approach encompassed the work of different fields which resulted to be more interrelated than expected; as shown in the conceptual map (Chapter 2). The analysis of the smart city practitioners' work gave insight into the complexity of addressing values, multi-stakeholder collaboration, and the possibilities of tangible representation to support value discussions (Chapter 3). The systemic approach highlighted the connections between all these findings that shaped the final result.

The design outcome, NewEarth, presents an approach to design smart cities that embraces the multitude of worldviews, allows to make values explicit under a sense of safety, and engages in controversy through a tangible representation. Within the scope of this thesis, NewEarth has shown the potential to support value discussions to reframe the approach to designing smart cities. Through a systemic perspective and by embracing controversies within a fictional setting, NewEarth has addressed the resistance to untangle value tensions to surface their creative potential. Moreover, it presents an opportunity to stimulate relational learning in transdisciplinary research.

In conclusion, the knowledge presented and the insights gained provide important information about intervening in a socio-technical context through physical collaboration tools. By creating an intervention that promotes an alternative way of communication between scientific and societal practice.

"We don't see things as they are; we see them as we are."

Anaïs Nin, from The Seduction of the Minotaur, 1961

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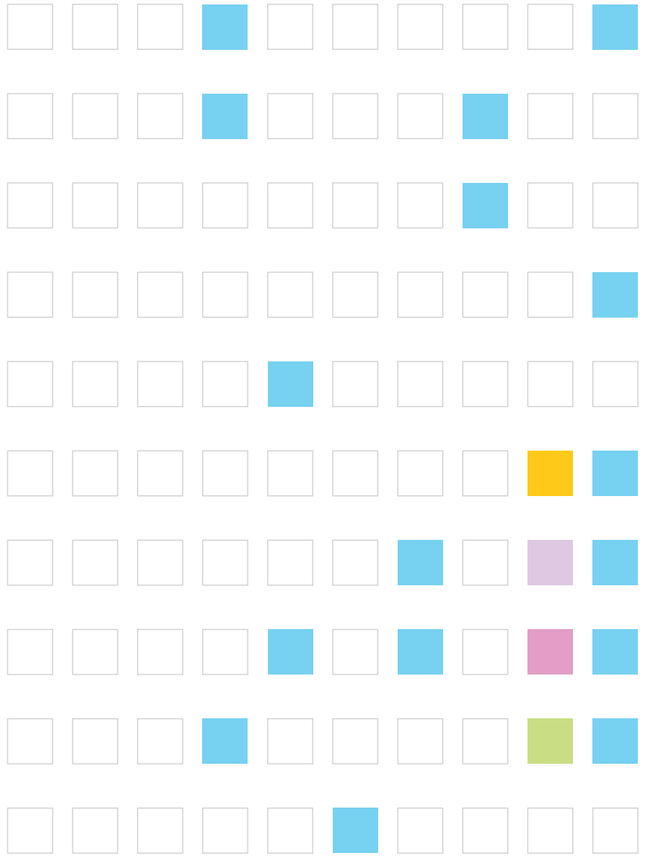
10 APPENDIXES



Appendix A

Tangible representations

From literature research, eleven tangible representations were identified which are relevant for this thesis. A brief description of each is presented below covering their goal and physical elements.

Tangibles for societal challenges

[*X]Changing Perspectives* project (Jaasma et al., 2017), an interactive table that integrates tokens with symbols open to interpretation, the physical tokens are used to discuss public issues by physically positioning them around the table to generate a "shared landscape of meaning". Their representations provided participants with tools to materialise their input, associations to structure interaction while leaving open interpretations and means to visualise conflicting interests to support discussions surrounding data-driven municipalities. Thus, the significance of such a system moved beyond merely representing information, to focus on providing participants with resources that directly supported a situated process of participatory sensemaking.

The *MR-Tent* (Bratteteig & Wagner, 2012), a collaborative mixed reality application for participatory urban planning, accompanied by ColorTable, a tangible user interface, create together a space for different stakeholders to create, explore and manipulate urban design proposals. Participants are able to interact with tokens on physical maps representing the urban context and scan the physical 'content' (images, 3D objects) to then modify different parameters (scale, transparency) visualised in the projection. Thus, participants were able to start creating the mixed reality scenes simultaneously to the discussion of design solutions.

The *Envisionment and Discovery Collaboratory* (Arias et al., 2000), an interactive whiteboard with objects, with physical and digital representations, representative of elements in land use and transportation (residences, roads, cars) to create a shared understanding and problem framing in transportation planning. Participants are able to interact with the objects, draw interactions between them, plan urban interventions, and further reflect on the impact of their design decisions. This physical-simulation game serves as support for framing complex urban challenges, creating a shared understanding, and addressing conflicting interests, through an argumentative approach that aims to create design dialogue within the multitude of perspectives of participatory processes.

Tangibles for systemic representation

Material Landscape Kit (Lockton et al.), a kit consisting of a selection of laser-cut paper elements, designed as stylised landscape features (e.g. hills, rivers, trees) and meant to be modified by participants to support the discussion around their experience of interdisciplinarity. The landscape features elicited a specific set of metaphors that enabled the exploration of different ways of phisicalising ideas: mapping mental modes, establishing relationships and performing the dynamic interactions of the systems. The material qualities of the kit became a prompt, not only for individual storytelling, but for a collective construction of a model that reflected a narrative developed together.

Aguirre-Ulloa & Paulsen's (2017) work, a systemic and service-focused *multi-sensory mapping tool* to create a shared understanding of relationships in public services through different textured thread-like materials (yarn, metal wire, rubber elastics) to connect poles placed on stakeholders' photographs. By giving meaning to the materials participants can assign different associations to the same materials and create a shared vocabulary. These materials are later attached to the poles at different heights, representing the relational power or reciprocity among the stakeholders presented. Through the process of attaching symbolic meanings participants can gradually move towards a shared understanding by prototyping the relationships; bridging material sensitivity for relational thinking.

Tangibles for value elicitation and negotiation

Value scenarios (Friedman & Hendry, 2019), a design method that introduces value sensitive prompts into a co-design process to generate a reflection-in-action process. Participants were provided with an assortment of craft material to develop prototypes of cell phones that could keep homeless youth or young adults safe.

After creating their initial prototypes, they were asked to iterate twice, in relation to a stakeholder prompt (value scenarios) and a design prompt (envisioning cards). The objective was to expand a co-design space, so that the focus of stakeholders could move beyond the form and function of a tool, to also pay attention to the social context of its use and the values of individuals and groups.

Stakeholder tokens (Yoo, 2017), a toolkit composed by labels and 10-20 easily distinguishable physical tokens for mapping stakeholders (direct, indirect and excluded) and their dynamic interrelations for a later enactment, through scenarios, of the interaction; which can be used individually or in small groups. The toolkit aims to support the understanding of the technology's context which may involve conflicting perspectives by supporting participants to elicit their mental models of the stakeholder network. Furthermore, the toolkit contributes to create a more detailed set of stakeholders, identify overlooked stakeholders, and articulate the intertwined multi-layered relationships among stakeholders.

Voicing values (Leong & Robertson, 2016) are participatory design workshops that sought to enable ageing people to express and make sense of their core values in action. The workshops involved an activity of "show and tell" in which each individual participant, using a personal artefact brought for this purpose, talked about what mattered to them in regards to their lived environment, their social engagement and their wellbeing. After reflecting on the presentations, the group collectively identified and listed shared values. The artefacts became useful tools for the participants to articulate their core values in relation to their experience of ageing; as they provided cues in their storytelling, served to emphasise specific points and triggered additional stories from other participants.

Tangibles for all of the above

The Dilemma Cube (Matos Castaño et al., 2017), a 3D collaboration tool formed by a cubic structure which builds into a systemic representation of the topic as participants add possible courses of action or their consequences; thus representing the causes, effects and the relationships of relevant stakes related to the topic discussed. Based on cognitive mapping, the tool aims to enable participants to share their interpretations of the project, through post-its, and the connections, via a red or green connecting thread, regarding land use planning. The tool acted as a filter for high stake issues, elicited participants' perspectives, and represented the divergence of views; thus visually displaying dilemmas and their interconnections. The multitude of interpretations on the mapping allowed participants to reflect on the importance of the language used and the different frames co-existing on the project.

The *Moral design game* (van der Vorst, 2022) is a serious game that focuses on discussing smart city technologies from a moral perspective. By taking on roles, players explore their position (pro or con) in regards to the scenario presented. Scenarios present proposals for implementing smart technologies in the city. The analogue game consists of a board with mapped personal values for players to place their tokens, character cards, currency, among other elements. The goal of the game is to reflect on decision-making processes of urban technologies.

3P (Andersen & Mosleh, 2021) is a tool designed to make opposing stakeholder perspectives visible through different tangible elements in the initial phases of a collaborative process. It consists of a 3D tower and colour-coded bricks that offer the space and material to frame and map a discussion through 'versus-narratives', incorporated in cards with dilemma themes and triggers for conversation. Together, these tangible elements provide a scaffold for exploring different stakeholder perspectives by explicitly visualising opposing values and interests. The mediating nature of the artefacts, not only allows participants to express their individual viewpoints but also invites to an exploration of new understandings.

Appendix B

Interview structure

Hi [name of interviewee], First I would like to thank you for your time. Before we start, I would like to remind you that I will be recording this session and all identifiable information will be modified for my reports and presentations, this includes people's names and any organisation or specific project mentioned.	
PRESS RECORD	
Could you give a brief introduction of yourself? From your experience, I would like you to remember a smart-city related project that was challenging and interesting	
Could you briefly describe it? Could you share what this project is about? How does this project started? This project was done in collaboration with who? Were there citizens involved?	
In the beginning of any project, it is needed to define the scope and boundaries of the work that will be done. In the design field we refer to this as "framing". (Give example if neded) Decisions are made of what to include inside the frame and what will be left out.	
On framing	
Could you describe the overall process taken to delimit the scope of the challenge with such a diverse group of stakeholders?	
During this process, do any conflicting views arise?	
YES: How does the stakeholder group deal with these situations? Is the situation resolved? How?	NO: Why do you think that is the case? Is there a part of the process that helps prevent these disagreements?
On values	
In the same process, are there any examples related to conflicting views on what one thinks is right/more important?	Would you consider the individual views are represented in the initial approach to tackling the challenge? How come?
As a group, how do you manage these situations? How are these dilemmas overcome?	
On tools	
Are there any tools/methods that the team uses to address any conflicting views? Are there any tools/methods that the team uses to frame the project?	
Before we conclude this session, Is there anything else you would like to share? Any questions you may have for me?	
Once again, thank you for time and have a nice day.	

Ethical approval

UNIVERSITY OF TWENTE.

Estefanía Moras Jimenez

FROM
A.M.Klijnstra
T 053-4895607
a.m.klijnstra@utwente.nl

DATE
9 September 2022
REFRENCE

PAGE
1 of 1

SUBJECT
LETTER OF APPROVAL

Dear Ms Moras Jimenez

The Natural Sciences and Engineering Sciences Ethics committee has reviewed your submission for "Develop a research tool for disentangling embedded cultural meanings in multi-stakeholder collaborations within the problem definition stage of the participatory processes" and based on the submitted material has formulated a positive advice for the Dean.

On the basis of this advice I approve your application and leave the responsible execution of this project in your hands trusting that you will conduct this research in a manner worthy of the University of Twente.

The request has been registered under **reference number 2022.173**.

I wish you good luck with your research.

Yours sincerely,

Prof.dr.ir. H.F.J.M. Koopman
Dean faculty of Engineering Technology
University of Twente

PO Box 217
7500 AE Enschede
www.utwente.nl

Appendix C

Interview transcripts

Transcript of all 9 interviews is presented ahead.

EM [0:0:10.370]: Yes. OK. Well, from your experience in this projects, I would like you to remember one of the smart city related projects that was a challenging and interesting for you.

EM [0:0:21.910]: Umm. If you could pick one and you could briefly describe it to me.

Int01 [0:0:26.450]: Don't I have to introduce myself or is it uh, coming just out of writing?

EM [0:0:31.70]: Umm yeah, that would also be nice. Just so for my own knowledge. Yeah sorry.

Int01 [0:0:37.350]: Yeah, yeah, no, no worries. I I'm. I'm [redacted] I work at the [redacted] [redacted] for 2 1/2 years now. I studied cultural anthropology. Did the Master in [redacted] at the topology of a sustainable world it's called.That was already a few years back, so now I'm working as a [redacted] and our role in the EU projects we engage in is the communication role and we also do project management for Smart city related programs like [redacted] [redacted] in the Netherlands, I'm not sure if you are aware of this? But yeah that's a bit the context and and your question was.

EM [0:1:36.300]: Yes, I thank you for the introduction. If you could describe one of the projects that you've been involved to that you find challenging and interesting, that would be the project that we would be talking during the interview.

Int01[0:1:50.920]: Yeah, I'll choose the [redacted] project.

EM [0:1:53.680]: OK. Could you briefly describe it?

Int01[0:1:57.320]: It's a [redacted], research and innovation project. We are currently in year three of the four year duration. It's a big project with partners from three different cities, [redacted] [redacted] and [redacted]. The reason being that within EU projects they want, uh, usually different climate regions as well for the, yeah, the pilots and each city. The interesting thing with this project is that each city has a different focus, but all related to water management. At [redacted] it's about, uh, water runoff at construction sites and measuring the water quality in development of of sensors in [redacted], it's about the climate resilient cit, it's about heat, experienced heat in the city, but also how to prevent flooding and predict, maybe, heavy rain. And in [redacted] it's focused on the sewers, how to prevent clogging. It's on the maintenance side but also with what sewage can say about like health of a certain population in a certain neighborhood. So they built measuring stations in three different neighborhoods with different social economic, uh, people living there. So that's a. Yeah. So that's in short, the the project and you can find it. Look it up if you need some more details at [redacted] But also if you type in [redacted] you can see the [redacted] info about the project. Like, yeah.

EM [0:4:2.60]: OK. Thank you. And from the parties that they have in different cities, are they all researchers or what is their background?

Int01[0:4:11.980]: Most of them are researchers, indeed, yeah.

EM: OK.

Int01[0:4:16.960]: Yeah. So it's a research and innovation project. So there are researchers on different levels, for example in [redacted], it's more the research also in lab a lot of lab work, well in, [redacted] they are researchers that are more connected to the local government, so not like lab work with more, yeah. How can you say it like more distant from the field?

EM: OK, so this structure changes depending on the city.

Int01[0:4:56.150]: Yeah. Yeah, it's a very diverse project, but maybe that's also a bit of the challenge, but I guess we will come up with that later, yeah.

EM [0:5:5.520]: Well, it sounds very, very interesting project and well, the focus of my research is at the beginning of this project. So the part where you are defining the scope, the boundaries of the project, what you're going to be including and what not. This in design, we call this as framing. So it's basically where do you wanna see the project from, what's left outside and what's included in the in the project. Could you describe how this process was with the [redacted]?

Int01[0:5:41.570]: Yes, I can, I describe it partly, but also it was some of the elements were also before the proposal was written before me, but that's also very common. But there is a, there was, also a different team on writing the proposal a compared to the people who would be working on it. So the first step I was with, there is a call from the EU like you have you can hand in your proposal, Uh, on a certain topic and you need to score points, so there is always like some strategy involved. See OK, we need certain cities. We need different climate zones. We of course we need a we need enough scientists because scientists are counted in those projects and, yeah, these were important things and then the proposal gets drafted. Yeah, you end up with like the grant agreement and with the grant agreement that's leading throughout the four years, the projects goes on and the interesting thing is I have to do, I have to, the actions that I have to undertake now are the are decided like four or five years back. So that's not always really connecting to the reality. Now, because you can't know up front how a project will go and what would be a logical thing. For example, we, there was hackathons were written into the project proposal, but there was no, we don't have a technical, scientific, technical following because the project is of different nature. So having a hackathon it makes no sense because we don't have the network of technical people, but it was thought up at the starts because people thought, oh, that could be interesting and probably scored points. But at the end we, yeah, and then you have to have an amendment and like explain why you're gonna go for another approach etcetera, but that's a, yeah, now I'm a bit diverging from the subject, but.

EM: No, it's OK, don't worry.

Int01[0:8:19.570]: Yeah. No, no, so my point is that how you envision it from the start it's, especially for a long project, it's difficult to keep that exact line, cause how? Like with predictions, you can the further you're going to the future, the less, less certainty you can predict anything. So that's also with the project that's written four years ago.

EM[0:8:49.980]: OK. And is there a reason why the people write in the initial proposal don't continue in the project?

Int01[0:8:56.850]: Yes, because it's a different expertise. It's a job on itself. You have companies that are specialized and people were working within departments that are specialized in writing a grant proposal. So that's, so that's why it sometimes doesn't really fit with reality because the people that write it don't have to do it.

EM[0:9:27.760]: Ah, OK, and I'd imagine during these past years of the project, have you had, how do you address the process every time you have to reevaluate what is the focus of the project and what's not like for example with the hackathons?

Int01[0:9:42.550]: Yeah, yeah, that's so maybe I, I sound negative with the first thing, but there are possibilities for iterations during the project, but you are dependent on a good project management and the project management that keeps sight of the goals, the structure so that the project management with this project lies [redacted] and they do a good job of like really making sure that we have fair regular meetings and we talk through the deliverables and also write work plans. OK, how are we gonna address the deliverables because they are written in the in their agreement but, you, not all the work plans how to approach it are written four years ago, you're right. For example, the deliverable start in month 30 of a project and you have to hand it in in month 42 for example, then you start rising the, your approach to that deliverable, you, you you start writing a few months before the start of the deliverable and then you can adapt more to the current setting.

EM[0:11:1.320]: OK. And that rewriting of the approach, does it happen individually among the teams or well among the researchers?

Int01[0:11:11.580]: No, it depends. You have different work packages and everyone is, there is a lead responsible, uh, There is a lead for every work package and the lead is, uh, is always a company or organization, and internally they decide who will write the updated version.

EM: OK.

Int01[0:11:37.980]: So it's not that, it has to also confirm with, it also has to relate to the, to the project proposal, to the agreement itself. It should. And if it differs too much you need to have a official amendment to change things, for example. Or to add things to it, yeah. And it just more technical one. Yeah. Yeah. But that's also interesting, because sometimes it is, it's more our… you need to know how to navigate it. Like the the technicalities and the rules and the things, sometimes it seems more important than the output. And that's you don't want that. So that's always a balance. The reporting is not a goal on itself, but it is a goal. Otherwise should be able to get funded, and there are a lot of rules. For example, if you use a logo, it should be [redacted] logo should be included, but it shouldn't be. It should be the same size or bigger as the biggest other logo on the page and you have endless of those rules. So yeah.

EM[0:13:0.360]: Yeah, I can imagine. And doing this whole process of reframing the project. Do any conflicting views arise between the the stakeholders involved?

Int01[0:13:19.710]: Uh. Yes, sometimes. But there's also always also a conflict. How to deal with conflicts written into the grant agreement and the contracts that are signed. So if somebody says. Yeah, but I… I didn't encounter real conflict more like the budget ran out: OK, how can we? How can we mitigate this? How can we make this work with less budget? Or maybe get bridges from other partner to that partner or things like that, but not really. I'm not sure what what type of conflict are you referring to.

EM[0:13:59.650]: For example, conflicting views on whether one stakeholder consider one aspect more important than the other or they think that a certain approach is right and maybe others are wrong.

Int01[0:14:16.190]: Yeah, but that that's more like a scientific approach or saying now, right it's more.

EM[0:14:25.300]: Well, it could also be more related to the personal views of each researcher and how they want to tackle the challenge.

Int01[0:14:40.210]: Uh. Yeah, I don't encounter that much. Maybe it's internally within, for example, because you have groups of researchers and then they have one spokesperson, so it's unclear. Uh, we get like the information that they want to share to the outside world. Uh, we get access to that, but the process in front and the internal discussions with the scientists are not public. So I am not aware of if they have different methodological approaches or things like that.

EM[0:15:20.960]: OK. And then this reframing of the project comes from further back in the I would call it organizational structure of the project.

Int01[0:15:33.900]: That's it's more like you have a reporting project. Yeah, reporting the big project. You have the big project and then you have different reporting points during the project and during the project things may change or situation or COVID happens and then you can't do physical workshop and then you have to rethink within the boundaries of the research, you have to yeah, you have to think within, uh, within the boundaries of the grant agreement, so you have a grant agreement and then you reach, yeah, the goal is with this hackathon to reach X amount of audience and to inspire this amount of people they think, OK it's COVID, we can't do a physical action, we can't travel. How can we reframe it to be true to the nature of what was written? And then you, yeah. Then we came up with a water challenge, and it was more online and less technical. So and lots of more people could participate so this is an example that we reframed the deliverable, however, keeping the goal of the deliverable intact.

EM[0:16:53.240]: OK. And would you consider that the in the individual views of the of the team are represented in in the plan of approach?

Int01[0:17:1.740]: Sorry, what kind of fuse?

EM[0:17:3.420]: The individual views of every researcher.

Int01[0:17:7.130]: In the in the grand agreement, you meant what's written before.

EM: Yes.

Int01[0:17:18.970]: Yeah, yeah, but it's more like I said, the people that are involved in writing are often not the ones that are involved in working on the project. So it's not the individual views of the people that are working that are written into it.

EM[0:17:40.910]: And when you have to redefine these plan of approaches and do you think there's some individual perspectives there?

Int01[0:17:52.260]: Yes, of course because nothing is neutral.

EM: Yeah.

Int01[0:17:55.410]: You don't have like some kind of.

EM[0:17:55.610]: Could you perhaps think of an example?

Int01[0:18:0.220]: Yeah. Now what I was yet to go deeper into the hackathon, the element.Uh. From my perspective, I didn't see it as feasible to have a hackathon because we simply didn't have the community, even if it wasn't COVID, we couldn't organize a hackathon because we hadn't didn't got enough interesting data to do something with. It was nothing that people could go through or spend an evening and make something fun or like. What's? Yeah, the common theme with hackathon is that you get a bunch of interesting data, for example, from an app that that that can provide some music and you come up with a new idea how to present the music or make an interface or something like that, but the date of the project is very specialistic not interested, interesting for an hackathon, but that's my analysis of the situation and then I made a, I made a decision to not do the hackathon would come up with something else, because otherwise I think we would be stuck halfway and then we couldn't have finished deliverable and then if we don't finish the deliverable. Yeah, we can't. We have to finish it because otherwise we can't progress in a project.

EM: OK.

Int01[0:19:38.650]: So there were like, personal views, but I'm not a scientist. So yeah, it's different from like.Yeah.

EM[0:19:48.690]: Yeah, I understand. And going back to what you mentioned on the ground on how you deal with disagreements, could you go deeper into the into that topic?

Int01[0:20:2.50]: Yeah, of course there is a contract. So there is like if something would really escalate or some party wouldn't come through with what they promised the project management have some means to do anything about, do something about it, they can escalate it. And they can. Yeah, they have like, just like with every contract, if you don't deliver, then the organization that doesn't deliver has to pay an X amount etcetera like, something like that. But that's not something I have to deal with, and it's not something what happened within this project. Uh. Yeah. So there. Yeah, I'm not sure. If you are not happy with the work, someone delivers it's, it's not that you really get a. Yeah. Yeah, it's difficult to say. For example, I I need data, I need input for the job, but if they don't give input then I can't. Can't communicate about what they are doing.But then I write in the deliverable form because of the lack of input, we couldn't do this and this and this and this. So it's more like an indirect. Uh. Indirect conflict. Not really conflict, but it's more like a reasoning. In a public document that because

party X didn't provide the platform yet then we couldn't communicate about it so that's the reason why our deliverable isn't as full as it should be.

EM: OK so. Yeah.

Int01[0:21:57.830]: Tell, but make you everybody? Yeah. Yeah. No, sorry. But everybody. Everybody needs the project to succeed, specially dependent on one another, so you don't want to escalate it to too much

EM[0:22:15.320]: OK, so the agreement specifications on how to deal with conflict. They are more based on the teamwork dynamics, right? Or do they cover any other topics?

Int01[0:22:31.90]: Yeah, you have. You have like the the contract with all rules, but that the other one everybody wants it to succeed. So everybody keeps each other in the game, so to say.

EM[0:22:46.980]: Umm. And I think we have, uh touch upon this, but in case something new comes up, are there any tools or methods that the team uses to decide when to make a change in the project? For example with the with the hackathon or with any other situation?

Int01[0:23:11.290]: There's like a set to, say, chain of command, you know. Everybody, it's a very clear structure who is responsible, which organization is responsible for what. So if you are the responsible organization for a certain work package, it's up to you to solve it and you don't involve the other parties, other than the project management. So for example, If the money runs out for like, uh, doing, putting down a measurement station with sensors, etcetera, then the person, then the organization responsible communicates that to the project management, not to the others, they communicated to the other work packages, but more like this is happening and we are in contact with the project management to to solve this or make an amendment, to say we're gonna downscale this element and do that so it's all the responsibilities are within these these structure of work packages and responsible responsible for the work packages.

EM: OK, then it's more of a individual per organization kind of responsibilities, right?

Int01: Yes.

EM: Well, I think this would be the end of uh, of my questions. Is there anything else that you would like to share on this topic?

Int01[0:24:56.270]: Yeah, yeah. I think the interesting thing with such EU projects, I think that it's good that they have a lot of, there is structure which you need organization to work together with all different cultural backgrounds, et cetera. So you can leave it up to, yeah, you have to write it down some somewhere and somehow how you want to approach it otherwise it won't work. So that's that's a good thing. Yeah, but. I think sometimes the focus is too much on getting the deliverables instead of getting the impact and I hope that's not, I try to focus on the impact and also get the deliverables but I believe that with these international projects, you can, they are essential and if you want to change anything on a bigger scale. So that we have to work together to create a better world, or in this case, our European project, to create a better Europe. And so that, that's why I think it's a good thing we do the communication for your project that sometimes in the early, earlier it was the people started the project with research et cetera they communicated we're gonna start the project in two years, later we finish and these are the results. But we tried to communicate throughout the project about the things that are happening, what's what goes well, what what we have questions with, where we can engage the community, etcetera. So the projects are more like connected to the the daily reality of other people and not like once it starts and then it finishes and then you have some results somewhere in the database so I think that there is a lot of value in this project and sometimes it's not being appreciated enough that value. And that we, yeah, as society should do more with the results of these projects. Yeah, that's a bit like a what we are aiming to do or what I'm aiming to do and I think it's important.

EM[0:27:35.230]: OK. And well, one further question just on what you touched upon. For example in this project at some point do you collaborate with the citizens or residents of a specific municipality or country?

Int01[0:27:52.230]: Yes, yes. We did like [redacted] in [redacted] that's within the project it was developed like an approach and an App in a method that you have certain predefined routes in different neighborhoods of the city, and you walk with somebody of the municipality organizes a walk with up to 20 people and they go to different spots, predefined spots, and then they note down on the app what their experience heat, what they think about the environment, what they about the greenery and impact of water and at the same time also the temperature is being measured with the device and intensity of the sun, etcetera. So then you combine the exact data with also the experience data of the inhabitants of certain city, and that's like a very concrete connection between, yeah, a project and the local people. And in [redacted] for example, it says they developed a social, last year, game that that is being introduced in different schools about educating them on what really happens below ground in the sewer system, etcetera. And then this will be integrated into the in the primary school program. So this is also a a very concrete result of the project that did right directly deals with citizens so. Yeah, these are two examples.

EM: Yes, sounds very interesting.

Int01: Yeah.

EM[0:0:-1.-940]: Yeah, I think it's recording now, yes. Umm, well, uh, highlight that. Could we start with a brief introduction of yourself first?

Int02[0:0:10.70]: Yes, of course. So I'm [redacted], and I'm a researcher at [redacted], so I also work at [redacted] group and my expertise is on a collaboration. Uh and in multi stakeholder settings, especially for infrastructure development and since 2018 I have been working on a project. Uh, that revolves around smart cities and how to stimulate civic engagement and and yeah. And ethical reflection on the impact of technology in society for these kind of projects. So and then for these purpose. And what I use is a well, like different participatory design. Also futures design, etcetera and then I come up with methods and tools to bring people together and then really come up with an inclusive and responsible smart city visions that reflect the needs and interest of diverse stakeholders and interest groups, both from the public and private sector, as well as, of course like citizens. But then that's always a little bit of a tricky. And let's say like a. Kind of. I always say, like even if you work for a company or if you work for the government you're still a citizen, righ? so then we're all citizens and then we can all have like different functions. And then what we do in our, let's say our day job, but then let's say I stimulate quadruple helix collaboration like, then that would be the label so that that's what I do and I've been working on this project and now we're wrapping it up. Umm. Then we collaborated together with the municipality of [redacted]. Umm. And then I like a very interesting consortium as well of urban planners, designers, lawyers, etcetera. And then we, yeah, we come up with the with these creative forms of engagement and test them on the ground. So that's what they do. And then now at the design lab then I'm working on something called responsible futuring. So it is an approach to foster transdisciplinary collaboration. And also let's say make these futuring processes and and sapient futures like an inclusive and, uh, responsible process in which everybody can have agency and agency to really influence what is going to happen right in certain projects. So then what I do is also like I bring communities together, I organize workshops and sessions etcetera to really explore what we call alternative imaginaries. So it is like really challenging many times, like top down visions of what the future should look like, and then what we do is like OK, we give methods, tools and the means for people to come up with their own vision, and then the things that they could actually like to achieve. So that's in essence what I do like a little bit of a of a long summary of my my role.

EM[0:3:43.210]: It's a. It's a very interesting background and it actually relates with my research. So thank you for doing the interview.

Int02[0:3:53.640]: My pleasure. And then something that perhaps is also interesting to mention is like as part of my work. So I'm a researcher, so I have an academic background, but then I also have an industry background. Umm, so I really work on being the linking pin between research and academia and theory, but then also putting it to practice. So I find it that then that's a very important part of my work that then we can constantly be working in this. Iterative processes in which we can explore. Umm, an experiment with these methods and tools put them to practice and then bring those lessons back to what is the theory. So I really like being in this intersection, so that's that's something that I do.

EM[0:4:43.150]: Sounds really interesting. Umm well, from your vast experience, uh I will like you to remember a smart city related project that was challenging and interesting for you.

Int02: Mm-hmm.

EM: And if you could briefly describe it.

Int02[0:4:57.210]: Yeah. Umm. So. I think. I'm thinking now. So then which one I I could. I could mention so and it doesn't have to be a project that I was working on, or does it? Or can it be a project that I know of?

EM[0:5:9.120]: I think as long as you were involved in it, it would be enough.

Int02[0:5:29.400]: Yeah. Then. OK, then what I can tell you is also like from my project because then. So we were working on the [redacted]. Right? So then that really the project we have been working on and then we have been working and

collaborating at a higher level. So what you do, what you have usually is like, OK, you have smart city initiatives that then they can be initiated at the municipality. So then there are these intentions to implement and deploy technology for specific purposes. And then they are connected to a policy, they are connected to really like different plans that the government is going to have. Like, OK, how could we improve air quality? OK, what if we install like these sensors? How could we make our streets safer? OK, let's go. And then let's install like these different surveillance cameras. Or very interestingly, for instance, like in the municipality of [redacted], was like this Wi-Fi tracker. So OK, how can we make sure that we are going to keep track, like in order, for instance, to promote our city and then to know how many visitors we have every weekend? And then how can we market our city in a more efficient way? Let's install. Or something that they call like Wi-Fi trackers in the streets. And then what they do is like they count how many people are visiting our city center every weekend or every day, and then we can really estimate like, OK, we have, like, so many visitors this season and then this is what we can learn. This is what they do, etcetera. So then they have like, these kind of policy or more like high level decisions and then they implement the projects. Something that was quite interesting and then also like I can very openly talk about it with you is that as part of our project then we were having a lot of conversations with stakeholders and with the government at that high level. But then they were very reluctant of having certain types of discussions with us when it was about specific projects. So for instance, to give you an idea. Umm, there were plans for us to organize like interventions around this [redacted] But this was back in [redacted] or back in [redacted], actually already like it was quite quite some time ago. And then we were thinking like, oh, it would be great if you're going to implement that technology then we could have conversations on the ground with citizens about the “hey, did you know that then when you are passing by here and then visiting the city center, whether you are like a resident of this city or a visitor?, did you know that there is this type of technology? That is recording data of course in an anonymous way, but they are actually checking that your Wi-Fi is on and then they are using your data for these purposes. So are you aware of this? How would you feel about it, right, if you know that then your data is being collected? How would you like to to use it right? So then what kind of uses do you think your data could have? And then we were planning to have like this type of interventions on the ground. And I mean, I don't know if this is relevant for your research, but then I think it it it says something. And it is that we didn't get the green light to do this kind of thing. So, because of certain political and some kind of reluctance, I would say at the political level. So people, especially at the municipality, they were afraid that if we were going to ask certain questions that they were controversial, then they would actually lead to trouble so many times they were like, Oh yeah, yeah, we have these projects, but. But yeah, no, it's not a good idea that then you do this. So every task. So this was challenging I think now thinking about it. Because, well thinking ethically or perhaps, like really opening up certain controversial discussions about the use of technology tends to be difficult for certain parties because it is. Opening like a like a kind of a field of potential and uncertain reactions that they don't know how they could react to them. Right, and then that they might go against a specific policy or specific plan and initiative that has been approved and they don't want to have like that resistance from citizens. So I thought like in general, if you think what was challenging, I think it was it was challenging to organize certain bottom up interventions for smart cities developments that had been approved and in in this specific context, because then I think it really differs per municipality. Umm. *And then I I mean this is a little bit of the record, but then some municipalities like the municipality of [redacted]. Uh, they are really advanced in their way of thinking, and then they have like a very active. And let's say hands-on ethical committee that then it's really checking and being you know assessing the type of technology and then bringing communities together and then doing it like really in a very participatory way. So then you have those type of municipalities that they are a little bit far in that sense, but then you have other types of municipalities that then you can call them like certain municipalities in the Netherlands. So that you have the same but you have the municipalities like the municipality of [redacted].* That they want to be, they are enthusiastic about it and but they find it very hard to have these type of conversations when they become real. So they I I think I thought that was interesting. Anyway do did I answer your question?

EM[0:11:53.460]: Yes. And for example, in this kind of projects where you have the different stakeholders. And at the beginning of the project, how is it decided where are you going to be focusing in on during the project? What's the scope and the boundaries and what you are leaving outside of the of the project?

Int02[0:12:10.250]: So you mean for me as a as a from my work?

EM: Well, in your experience.

Int02[0:12:14.390]: Or or in general for the project of the of the smart city. So what is part of the of the scope of this smart city project? Or is my scope?

EM: Uh, part of the project of the Smart city.

Int02[0:12:28.300]: Yeah. So in general. Uh, so? In theory and then the way things usually go is that. Do you have a specific urban need so you have something like you have an opportunity and then something that could be improved in your city thanks to smart city technology. So. And that really determines the scope. So then it can be OK. This project is going to be about for instance, and there was this other project. I don't know if you heard about it. It's called like. It's [redacted] It's called like the [redacted] So then what they do is [redacted] And what is interesting is like they are moving, so they have a route and then they take this route and then device like usually when you have a sensor then it's in this place of the city at this time and then it's just there. So then you can only measure that part of the city. But then when you give it to bicycles then everything becomes like more dynamic and then you can really like check the air quality at different times of the day in different parts of the city, like with different behavior like human behavior because then it's not the same when people are going to places during rush hours and when they are like it's during the weekend etcetera. So for instance in this type of projects it's like OK we have a need, a wish, an opportunity that it is OK then let's improve air quality and then that really defines the scope, right? And then that is really where it's supposed to define the scope. So it would be a technology serving a specific urban purpose. And then the way this technology is going to operate most of the times it entails OK then technology is going to be collecting certain data. Then it's going to be processing it and then it's going to be used for a purpose that has been defined. And then especially due to GDPR in Europe, it is very important that then that purpose is defined and then it's set at the beginning. It's OK if you are collecting this data. This is how you're going to be using it. And then there are certain rules and requirements that then you need to comply with in order to be able to use it. If you decide to use the data for a different purpose. I mean in principle you cannot. If you have a very good reason, then you can follow like a legal path and then make it happen. But then it's quite burdensome. And so then it like this urban need sets the scope and then many times what happens as well is like municipalities that then they tend to be the smart city initiators together with the Many they initiate the project and then they immediately start a collaboration with a company. Said they are most of the times like the technology provider and then. It also inspired by other municipalities. So then would you hear a lot is like ohh you the the municipality of [redacted] is doing this. It would be great to have it too. And then let's have a look at how we can also have it there because you know it's a good promotion for our city or it's a very cool use of technology and let's make it happen so. Or a very important ways like with this realizing the opportunities of like an urban and then many times it's something that some of our project partners and they are always calling calling them like prestige projects like really like there's a prestigious project or something and they want to replicate it somehow, so then they can also be a part of the of the newspaper, because and then I will finish my answer because for this scope of smart cities and many times it is also connected to a certain political agenda. So you have the [redacted] and then they are like, OK, then they know that they have a term of four years and it is good if they are delivering, you know like a nice exciting news of things that they are doing, so many times they are also using this as smart city developments as a way of oh look, we are using this technology to make sure that. Uh, you know, we're increasing the well-being of our citizens and then that's that's part of the newspaper then that really that's really very interesting politically, right. And then that the way it goes. And then there's a new term and then the the project might continue or not and then it really depends on the focus. So, but that's the scope, yeah.

EM[0:17:33.210]: And during this entire uh. Yeah, like negotiation process of well development process of the project. Um, do you encounter that the parties will, the different stakeholders have conflicting views on the on the project?

Int02: Yes.

EM: Could you give an example?

Int02[0:17:52.730]: Yeah. So there is usually like always these conflicting views. And then this is also mostly like a great part of where my research focuses on and then it's about the values, right? So then when we are talking about values, then we're really talking about things that matter to us and then for our communities, right, so you might even have it like a different level, so then you can have a community so usually I also have a little bit of… So you have stakeholders, right? And then you can have a stakeholder and then it's somebody again belonging to a specific organization. So then you can have the municipality and then that municipality is going to embody a specific value, but then you will also have individuals right within the organization and the institution. So then you also need to look at those interactions, right? We're talking to values. Then you need to have a look at how are these values being intertwined like a different levels, right? So I'm [redacted] and I'm working with the [redacted] It's not that I embody the [redacted] and I'm the person of [redacted]. There's certain things that I agree with as there might be other things that I'm I'm not feeling represented, right. So that's one thing. And there are always like these conflicting values. For instance, uh, I'm thinking also like a specific project that I could mention. I mean in general. Uh, so the the most common example, and then all all these discussions are always around a specific like facial recognition technology. So then this goes on and on and same with the Wi-Fi tracker. And in in all types of projects that then you're saying like, you know, they offer like a lot of benefits and opportunities. So if you have like a a like either like in general this is really like about collecting personal data so then it can really be your face to really recognize you and then know who you are or it can also be counting people right and then it might be that they say that then it's been anonymized but then it's not really anonymized because then they can also track the route you were following. So then they can say ohh we don't know who you are, but uh surprise surprise they know you. Left from point A to point B and then point A. Is your house, right? So then and then if you go to a coffee shop and then you go there and then I don't know, you do whatever you want to do, right? They know where you are going. So I think it many times like these values that are conflicts of privacy is really big in smart cities, as you know. So then really that's a I would say when you talk to people and then in our project that we focus on controversies.And many times we have discussions about like it tends, it looks like many times it's like privacy conflicting with other values and then privacy is always at the center. Many times we try to, in an artificial way, or we try to push, to steer the discussion towards other values that are different from privacy, to see where the discussion is going to go. But then it always ends up going back to privacy, you know, like it's really like a very hot topic. And then sometimes what we have been thinking is like, OK, then it really seems to be a very core and controversial element of the whole smart city controversy debate. So then we we shouldn't stay away from it. But so I would say for these projects and a very concrete examples, then I would say privacy. Intention with. Yeah, like in this case would be for instance, you can. You can have like a range of values like from security to also like. Perhaps I don't know like like the flourishment of the city, you know, like perhaps like that would be a value that and it's important, you know, like some kind of financial development of the city. So then when you were thinking about marketing and then how to market the city, so then that will be a very concrete example of cases that I know. Then. From the spread of our work then, we also organized a lot of simulations, right, and then fictional cases, and then fictional experiences in which it is not per separate that is being developed. But then we provide like what if scenarios or what if types of projects in which we explore like what type of values and controversies could be in conflict. And then one that we really like exploring and then one that is quite interesting also while thinking about the deployment of technology and society is really serendipity. So serendipity and influencing the whole urban experience, meaning that right now we are looking for so for instance also in like if you if you look at Smart city and mobility then it's all about efficiency optimization. You need to get there faster, easier than everything has to be seamless. There's no friction. You can save a lot of time and you know if you know where you have to go then we give you the most optimal route and then you don't have to walk like anywhere else in the city, right? So. What I find very interesting is also this discussion and then these values of the whole efficiency optimization intention with what an urban experience entails that also includes like serendipity and the possibility of exploring the city, the possibility of having like some encounters and interactions that you didn't expect. That actually are key to living in a city and living in community, and so I cannot point out that the specific project where this was happening, but I can point out that many simulations and many activities that we have organized in which this discussion has. And it has happened and I think it's also like a very important theme to tackle when thinking about smart cities and. Like how is it going to influence the urban

experience in general? You know, we're time obsessed. And and then smart cities reinforce that narrative.

EM: And yeah.

Int02: Yeah, I'm talking a lot. Sorry.

EM: No, it's fine. Don't worry about it.

Int02: I usually I usually don't speak that much, but it's like. I am so sorry [redacted]. I'm also trying to find like this is also thinking you know what talking so I'm I'm a little bit trying to do. Yeah. Like it's a little bit like a some kind of thing.

EM[0:24:59.170]: Yeah, don't worry. And within this, when this conflict arise between the the views, I mean, I heard you mentioning that you have these discussions among the group.

Int02: Yeah.

EM[0:25:9.360]: Is this the way that you handle these situations?

Int02[0:25:14.630]:Yeah. So. Umm, so this is a very so yes, yes. So in general. Umm, so one thing is something that I have learned in my involvement with this project is that sometimes when you are talking about, so you have controversy is you have conflicts, you have the dilemmas, right? So then they are all like same similar kind of nature, right? So in general, like conflicts are like these tensions that happened at the higher level, right. So then more of a these values in conflict kind of disagreements among different sectors of society about things that we should prioritize, etcetera. I learned that then some people are very reluctant. So the moment they hear controversies, you know, and the moment they they have like, oh, we're going to have a discussion about this. Then they are like you know, I don't want to be part of this. There is no need to have this. I really want to be controversy avoidant in that sense. And and. And then if that's the case, then it becomes difficult because then you first have to to deal with these things and to tackle these things and then also very importantly, to realize the opportunities that controversies offer because then they can. They can help you to think deeply about the impacts of your actions. They can help you to come up with new ideas that perhaps you didn't see before because you know you're trying to bridge, perhaps like things that, for instance, OK, how can we preserve privacy and at the same time keep the city safe, right. And then you can just be creative in the way you do it. But then you need to have that willingness right to have these discussions. So the first step is really like to have that willingness to sit down and then talk with other people that are going to disagree with you. Then the second one is really create this awareness of the type of tensions because many times it's hard to get this entry point, so many times you know, something is going on. But then the complexity of these tensions is is really large, so it's really hard to pinpoint. How to start that conversation? Where is it coming from? Like I know there is a tension, I know this is controversial, but why right? And then you really need to create awareness on why is this controversial, right. And then that really that's step #2. And then once you start like having this idea on why it's controversial you get an entry point of OK, then let's just start the conversation here. Umm I then it's where like the whole dilemma part starts and opens up right and then after instancing [redacted] Right. And then like, OK, how do you know? Like it's it's very important. The then you, you, you you have like this, this the decisions and then you can have like different strategies to focus on them etcetera. I my research and then my work I was also focusing on multi stakeholder dilemmas. So really dilemmas as a group. Uh, so because then you need to make a collective decision. And then as I as I collective as a group. You need to decide what is going to happen and in this type of multi stakeholder projects you have this multi stakeholder dilemmas and the way to do it. And then the way I think it works. It's also like OK then we create, we speculate about different scenarios of what if we did this right? What could be the potential consequences? And then you really have to engage in these processes of and then this is where, for instance, the whole futures design and speculative design comes to play like you need to cocreate like certain scenarios and certain features of, OK, we have these dilemma. What if we did this? OK, this could be potentially the consequences, right? So it is not that it's going to happen, but then we speculate together we co-speculate? OK. How do we feel about this as a group, right. So

then what is desirable? What is undesirable? Do we feel comfortable making this decision? Yes. No. And then, like you establish like this dialogues and then this co-speculation like these processes of co-speculation. And at some point then you reach an agreement on like, OK, then most likely we are comfortable with the future that could really look like this. And and then these are the type of trade-offs that we are willing to make, right? So then when you were making that decision, when you have a dilemma, then you are you need to make it like a specific trade off, right? So then you cannot always like bridge everything. So I in an ideal world and you breach like the conflicting views but then sometimes you just need to prioritize depending on what you have at stake? So, when that's the case and then you have to accept the trade off, then you need to also think of, OK, how are we going to mitigate right any potential negative consequences. So then you need to speculate have the scenarios think about what's desirable and desirable? Go back to the present, think about OK and now based on what we know and based on this direction that we think we're comfortable taking, where are these things, right. And then we could do in the present to achieve that future and then mitigate like potential negative thing. So I think those are this the steps. Umm, but then usually work that it's not and then something small criticism also on my own research. It's like many times there are these type of exercises and then you do them in a in in some kind of artificial type of environment. Umm, but then it looks like uh, you know, in a couple of hours you can figure everything out, but no, you know these things, these, these things take long time. So really long time. So then really you have to have a lot of discussion really. I was now talking to this student and then I was telling him this project that I was part of like the decision making process took 20 years. So yes I mean I was not there for 20 years but. But so to give you an idea of the magnitude, right. So then that's really the thinking and then how you implement it then you really need to have a lot of. Kind of buy-in from stakeholders to be part of it, so it's not easy. It's really hard because then people tend to feel. Like ohh I'm so busy and then now having this kind of discussions, why would I have them? So takes a lot of energy to mobilize these stakeholders. So this all sounds very nice. Then organizing it is very nice, but it's not that easy. Yeah, it's it's hard. Yeah.

EM[0:32:13.920]: And have you had the opportunity to have this kind of discussions in any of the projects that you have like with the municipalities or the company owners?

Int02[0:32:25.90]: So in a real setting, no, because then what we like? No, no, it's like it's a bit of a personal frustration. And then I think it's also very important to. To explore, you know why? Why? Why didn't you know? Why aren't they open to do it? We were so close. Like so many times. So we had these people that they were working on a development. It was again like also connected to the Wi-Fi tracking like, yeah, let's have these discussions. Let's do it. And then let's say there was this person from the municipality also saying like, yeah, we, we need to look beyond the functional use and application of technology and then really look at the broader impact really whether the implications and then how can we involve other members of like other interest groups etcetera. And we were going to have sessions, we had it like kind of, you know, we had a plan and then because like 2 weeks before that happened, there was like ohh, you know, he's not available anymore. And he was like, where did he go like? That sounds weird, but maybe no, no. But everybody you know, this project is already very complex and then getting it implemented, so then we're really concerned that then if we add these layer of complexity to have these conversations, then it's going to make things more difficult so. So no, it's not going to happen for the project. So we had organized sessions and organize workshops and and organized experiences. But they were coming from us and then they were based on a simulation with like minded people. So this is also very important. Till I think limitation. The work.

EM[0:34:21.180]: Yeah, I guess it's kind of the complications of politics.

Int02: Exactly.

EM: Yeah.

Int02[0:34:29.400]: It's like so. I think it's also an interesting finding, right? So in that sense, so you need that political buy-in and that's the and then you can have stakeholder buy-in. Umm, but you need to orchestrate the process in which you have this willing partners and and then if you if you have some partners that are not willing to to be part of it, then. Then it. Then you keep business as usual in

that sense, right? And then and then certain things become an afterthought because then this is also quite an important thing. So. What we do and what we want to do is like, really take in this controversies. Embrace them from the beginning and really embrace these the diverse nature of values and then use them in a constructive way from the beginning, because then we think like there's a lot to win, there's a lot to get out of that. And but in reality what happens is that there are developments and then controversies become an afterthought, once the conflict is there. Right. And then once things go wrong, then it's when it's like, oops, we need to do something about this. We need to mitigate. But then you already have like the people opposing to the project or perhaps, you know, missed opportunities and you get a full backlash and then we're trying to bring it at early in the process. So it's food for thought on how to make that happen. So I'm working on it. I'm professionally dedicated to that.

EM[0:36:16.250]: And to support all of these discussions and the workshops that you've mentioned, are there any specific tools or methods that you use to to support the discussion?

Int02[0:36:27.510]: Yes. So I think and I am, so couple of things. So one is I was talking about this entry point and you know for the controversy and [redacted]. Then we, uh, we developed this. This uh, methods like about uh, you know, like a value mapping activity. So really saying the moment then we have it like OK then you have this fictional case imagine that this is the future you have like different stakeholder perspectives. OK then let's see what kind of values are at stake at different levels. So individual level organizational level. Let's see where stakeholders are tensioned. And then let's see. OK, where these tensions exist, where we've like with actually, the participants feel that there are opportunities like to get new ideas or to reflect deeper, right. And then really what we do is like we create like this. Constellation of value conflicts that is making it visual right. So then it's making something that is very abstract like this controversies is making them tangible in a way, because then it goes from a from yeah. From this notion of conflict and controversy to something that you can see that you can tackle that then you can say hey what if you know we I see that then there's this value that then it's in conflict and then it's actually really the core of a lot of conflicts so. What can we do about it? Right. And then by having these conversations and making things tangible and visible then it really helps. And and then something that it's quite important is like we keep it open for participants to have their own interpretations of what is going on, just like in real life. So we provide these perspectives of the future as nuanced as possible, so then people can come up with their own. Yeah, with their own narratives and their own perspective of what is happening so. And then this is something that we do with this scenarios that we provide, but then it is something that could also happen with the real case. If somebody is giving a real case and then this is what is going on. These are the type of stakeholders and then this is something that I also have been doing with responsible futuring. So one of the faces of responsible futuring. Is also about like OK then I'm testing these tools in. How we have this situation that is difficult to tackle and that we have like a project or a challenge that is being to be addressed through the development of a project. So let's figure out like this constellation of stakeholder values and see what like how I like this thing of how we can have like this entry point. So it's like a combination we're working now on a on a paper and then it's like we combine what is like the speculative space coming from scenarios and then a participantory space like giving it to people and then making sense of of that future. So then that one and then the other one is certainly. Well, like the futures design inspired methods like speculative design or design fiction, etcetera. And so to have these conversations and it is very important that you really it is not that you predict how things are going to look like, but then that you speculate on this what ifs and then you make them tangible so people can relate to that future and then they can react to it. Because if if you give them like a PDF with these are the plans and then this is the policy and this is what we plan to do. It is really hard. It is hard to really reflect on. What does it mean actually. So what does it mean like and especially what does it mean for different stakeholder groups? So I think in that case. Speculative design and features design have a lot of potential, but something that is quite important and then I have mentioned it before, but I think it's very important is that. People can call speculate. So what happens many, many times, including by the way, in our own project, although we try not to do it as much, but then it's like ohh and then here you have your speculation and then how do you feel about it, right? And then like ohh a lot, there's a lot of value in that. There's a lot of value on like, there's somebody else's giving you a project and then you reflect on it. But I think there is even more value if you have stakeholders involved as part of a project that it is them speculating, right? So then it is, it is them creating like this. What if scenarios it is it is actually. Themselves that are bringing these futures to the present. So then they are in charge like they have the agency of saying like, OK, what if this future we have done it together then we can reflect on it rather than some kind of some designer like in this case or research or something telling you ohh this might happen you know. So I think these conversations are in my experience trying and, I wouldn't, so that the those two are like giving an entry point for the conversation and the discussion and understanding the interdependencies and then how the system like the stakeholder system is working together. So then that's one and the other one is this speculative methods and yeah. Yeah. There's so many names, right? But then futures design inspired methods or something. And with everything that is part of that, yeah.

EM[0:42:46.80]: And you have mentioned that sometimes these controversies are addressed later at the during the project. So are these tools also have been used in your experience later in the project or at the beginning?

Int02:[0:43:0.800] Umm, I think the understanding, I mean people are more familiar with stakeholder mapping and these kind of things, right? So I think they do that at the beginning of the project, but they many times they are not really focusing on the conflict. So then they are really mostly focusing on goals and needs and then this is what this stakeholder needs. And then they do that at the beginning. Really talking about controversies, I think I think. potential controversies. It can be so speculative. Design and futures design, etcetera. It is something that it is increasingly being used for policymaking, but it's not really done yet. So I wouldn't say that then that's really part of any process at the moment, like at least that I'm aware of in the Netherlands or within the projects that I have been part of. There's this interesting project, for instance, of [redacted]. And then they were using speculative design to inform policymaking. Right. And then I think if you have [redacted], then you it's it's a very good project to have a look at like in, in the way they have made it, like very accessible and then very applied to the context. And then I think it would be there would be a lot of value. In actually using that in smart cities at the beginning of the process. I haven't seen it and I it hasn't happened with the stakeholder and value mapping I think there's a lot of stakeholder analysis, mapping etcetera, but then it's not explicitly addressing the controversies or trying to unravel them. No, no.

EM: OK. Well, this would be the end of my questions. I don't know if there is anything else that you like to to share.

EM [0:0:0.0]: Yes, but I think it's working now. Well, uh, thanks for accepting to doing this interview, [redacted]. Could we first start with you introducing yourself and a bit of your background?

Int03 [0:0:17.200]: Yes. So my name is [redacted]. I'm a [redacted] in the [redacted] and my focus is Smart City. Specifically a case study of a [redacted] that's currently installed in [redacted]. And before this I [redacted]

EM[0:0:43.940]: That is very interesting. Uh, from your experience in this smart city projects, uh, could you prefer perhaps choose one that you've considered that has been challenging and interesting and give me a brief description of it?

Int03 [0:1:2.30]: Yeah. So the the main project that I'm a part of is, uh, with the [redacted] that's installed in [redacted]. Umm. And it is a [redacted] that has nearly, not quite, 100 sensors installed that range from load cells to strain gauges to accelerometers, and inclinometers and then we also connect to open data for weather data as well.

EM [0:1:39.400]: And who else is involved in the in the project?

Int03 [0:1:43.140]: So there's a consortium involved. So there's the main company and it's [redacted] that [redacted] and then [redacted] are all involved. Prior to us there were also other companies that were involved but currently using the data, it's mainly those three.

EM[0:2:6.350]: And the goal of the overall project is to achieve what?

Int03[0:2:11.800]: So the goal, there's a few goals, so one of them is to [redacted] it's because it's printed piece by piece. It doesn't behave the same way that you would expect, just a steel beam that was cooled together to react. So they're curious to create a [redacted] that can then be used to kind of monitor health. So structural health monitoring is another big interest and then on top of that data fusion. So there are different sensors that are collecting data and people are curious as to how to use the various sensors together to learn information or if you can see how the the relationship between different sensors works, and then you could use other sensors to protect the behavior of a different one so you can learn more from having less sensors in the future. So that's kind of what most of the group is involved with and I was more working on the human side of the project, so things like data transparency, public outreach, things like that.

EM [0:3:35.220]: very interesting. Umm. And then you, I imagine you join this project when it has already started.

Int03[0:3:45.300]: Yeah. So I joined the project [redacted] and at that point the [redacted] was already built and there were some sensors installed on the [redacted] and the [redacted] will showcase at Dutch design week. And I was there and I got to see that. But since I joined the project, basically all of the sensors were, the sensor network was changed and new sensors were installed. And I was also part of the project for when the [redacted] was actually placed in Amsterdam as well. So when I came in, the [redacted] already existed, and the sensor network existed but a lot has changed since I've been on the project.

EM[0:4:24.930]: OK. And this process of changing, does it change the project technically or also the scope of the of the research and the intervention?

Int03[0:4:37.170]: Both so I mean the the [redacted] itself has physically and uh, both physically changed and the software has changed over time. Uh, the sensor network has changed. In terms of my research, originally I was interested on using the [redacted] data while the [redacted] was in place to kind of understand more about the area. So if we could see kind of usage and kind of see patterns in activity while the [redacted] was situated in the [redacted], but due to delays of getting the [redacted] installed, I transitioned a bit more to work on. Yeah, like how do we figure out signage for the [redacted]? What sort

of information? Do we put on the website what happens to open data for the [redacted]? I also had a large role in creating our research group for the project and [redacted], where we kind of determine what will be the next steps and how are we going to do public data sharing and stuff like that in the future.

EM[0:5:52.230]: OK. And these uh transition that you mentioned that within the project well it's I believe it's kind of similar to what we in design called reframing. Could you explain a bit more how this process goes for you?

Int03[0:6:9.450]: Yeah. Yeah, it's kind of tricky to say because I think. All practical projects are constantly in flux, like I don't think anyone ever makes a plan, and that plan actually happens. So I mean, I like the idea of connecting it to reframing, but I also think that, that's just how projects are in a way. So and each step changes so little. It's not like there's a big time where it's like, OK, we're gonna change everything. It's just kind of piece by piece that's sort of what happens.

EM[0:6:49.590]: And would you say just happened during conversations or during meetings?

Int03[0:6:55.630]: Yeah. Yeah. So, I mean, there's various elements here. So if you're talking about my specific research. Yeah, there was like a a period where, OK, the [redacted] isn't installed yet and this is important and it has to be done and there aren't necessarily other groups that are better equipped to work on that. So we'll work on that first. Uh, so it's not even, it's more like there's a need for something and then you take care of the need. Umm, as opposed to assuming everything's changed and then maybe in the end you don't have time for something that you originally planned to do, but it's not like there was a sort of a big consultation and decision that was made and then, Uh, things stopped.

EM[0:7:43.530]: Uh. Then the scope of your individual research. Uh, are you defining it or is it defined by someone else in the consortium?

Int03[0:7:54.110]: Yeah. So because I was brought in. So I'm part of [redacted], which is [redacted], which is [redacted] and there's sort of space within that grant to do your own research, but are the original if you were to look at the grant itself, it's a lot about the fact, I'll just look it up now, so I don't say anything that's untrue. Uh. Yeah. So the role of [redacted] was to explore the role of smart public infrastructure and making and remaking public space, and specifically using this [redacted] and using, yeah, research by design and empirical philosophy to kind of, Umm yeah, provide insight on how smart technologies can be utilized, design for cityness and eventually promoting citizens feeling of ownership of the public space. So citizen-like governance. So instead of using data from the [redacted] to kind of analyze the urban space. I ended up doing more projects that were still leading towards citizen governance but without, yeah, using as much of the [redacted] data.

EM[0:9:28.970]: And what kind of activities have you been doing for the, did you call it citizen like governance?

Int03[0:9:35.850]: Yeah, citizen like governance. So some of the work that I've been doing has been on, as I said, data transparency and signage. So I had a, I guess, [redacted] working with her on creating signage for while the [redacted] was at [redacted] and sort of figuring out what needs to be on there, what are people interested? What do people understand in terms of symbols of? We wrote a research paper on this that was published by [redacted], and that paper is about the kind of importance of transparency, not just for personal data collection, but also, yeah, in all cases because these infrastructures are in public space, and if people, if you supposedly have a democratic government and people pay taxes, and these are for public good, then people might have a right to know so that they can have more autonomy in public space. So we wrote about that and then issues that happened. So there were a lot of changes when we, from the signage that she designed that was very informative to what [redacted] ended up deciding to put on the [redacted] which are just kind of these small signs on the corner with the QR code. Umm. And then QR codes are also a bit iffy because theoretically someone could put a sticker over them and then you end up on a different website. But because for non personal data there aren't as many

regulations so due to these abundance of personal data collection on the Internet, GDPR and similar laws were put in place. But for anonymous data there aren't as much regulations so it's unclear for a company what exactly they have to do, uhmm, for a smart infrastructure and where to inform people or how? And since that, that that that's not set, it's kind of disadvantageous for a company to put more information because it makes it look like they're doing more than other companies are when really no one is putting information out there. And so then we kind of, uh, came up with some recommendations and had four different, yeah, main avenues for data transparency, which were contextual, open data. So giving open data when it's necessary and to the partners who it might be helpful for data registries. Umm, education and then the last one was standardized signage because currently there is not a set template for What do these sensors mean? What kind of things need to be on signs? How big do they have to be? Where do they go? And so it's quite confusing for the public and also for corporations to figure out what they need to do and when? So that's one sort of citizen governance thing that I worked on and another as well. We had a [redacted] working on the website itself. So what do you put on a website for people that's going to be their main access? And do we actually show them data from the [redacted]? So there's a a setup now if you go to [redacted], you can see some data output from some of the [redacted] and… let me see I don't know if it's an accelerometer. But that, it was a decision to basically decide: do we show more information? But then people could misunderstand it or maybe it gives away information that we don't want to give. Maybe people will play on the [redacted], which might be more dangerous or noisy to to the residents. So we end up giving information that maybe might not that be that useful for people like researchers. But the research group didn't necessarily want competition when they had invested so much money in the sensor network. So balancing stuff like that. Umm, and then more recently I hosted a datathon where I took the steps to actually make three data sets from the [redacted] open and that involved working with [redacted] and also learning about the different recommendations. So [redacted] really, well and the Netherlands in general, is really pushing towards open data. They consider it a way to boost entrepreneurship, so it will, the ideas that will make more money and they think of it as an ethical way to yeah, boost innovation because you're making data available and they, that, there are rules. So it's not like you can release personal data again with this concentration on personal and everything else is kind of safe. Although the privacy officer did share that you have to be careful with this. So for instance, with traffic light data, if you shared that, so let's say there is a row of traffic lights that turn green, that might give away when banks are moving money between banks or when the royal family is moving. So things that might seem safe or anonymous to share might not be, but there's a yeah, a long list of recommendations. So, for instance, they want data that's open to, for you not to have to register. So theoretically anyone could access open data and use it for whatever they want, and be able to make a profit from it. But then you have to think that your average citizen is going to be kind of the least likely person to actually benefit specifically from the system. And then the argument is that, Oh well, companies that use it, their programs might benefit the citizens, but who knows? Like open data is also open to like foreign governments and militaries. And then there's the whole mosaic effect, which of course the more open data we have, the more those data sets could be connected. So it's a real balancing act not to say open data is bad at all, but I think it's kind of, umm, people consider open data natural step from transparency but in reality if you consider transparency, also being able to know how data is used, open data makes transparency in that definition impossible, because everyone can access the data and you're not going to be able to know what everyone's doing it with it, especially if you're saying registration is not necessary.

EM[0:16:16.970]: Yeah, I understand. And during this process of deciding, well, yeah, the decision making process, Uh, does it ever happen that there are some kind of conflict in views among the stakeholders?

Int03[0:16:31.350]: Yeah, of course. Umm. So yeah, one example is with the whole open data question and when to open data? There was, yeah, some parties in the group were very hesitant because they felt that, umm, their basically research advantage will be taken away if the data is made open and then others felt like, OK, but we maybe have a what is our our time limit here? How much of an advantage do we need? Is it six months? Is it a year? Do we have a right to an advantage when like grants might be from public funds? But on the other hand, if you don't publish, you don't get grants so that's just one example of, Yeah, sort of the decision making process and also a lot of our research group were engineers who might not necessarily be thinking as much about the ethical

implications of things. So not even like a disagreement, because I think everyone really cares about doing things the right way. But there is definitely steps of someone has an idea and then it's like, OK, well, maybe that's not a good idea because there might be these sort of ethical considerations or concerns.

EM[0:17:55.640]: What is the way or the process the the group goes to address these situations? Is it only during through discussions?

Int03[0:18:4.550]: Yeah, mainly through meetings. Umm, I don't think we ever really got to, I mean. So I'm trying to think if we ever really voted, it's not a huge group, so it's not like, it's pretty clear what people's thoughts are and we can communicate through them. And I think we try to keep in mind everyone's concerned. So it's like, OK for the datathon, for example, there were concerns, OK, what if research group can use this data and do something valuable from it? Or what if the public gets the data and missunderstands it and then maybe think the [redacted] is dangerous or something, but it's not because the [redacted] is dangerous, it's just because they don't understand how to read this data correctly. And then the the consideration then is OK. So what is? What would be a safe data set to expose and you can give the responsibility to those who are most concerned to kind of help with that decision making process because if they can choose a data set that they're happy with, then the rest of the group will also be fine with it.

EM [0:19:9.100]: And they're in this uh. Well, maybe not. For every discussion that you have, but during this process do you ever include the citizens themselves within the discussion?

Int03[0:19:25.990]: No, no we don't. Umm. And it's not for lack of desire. So there's, I guess a few different things going on. So when we, when the [redacted] was first installed or was first planned to be installed, there were meetings with the people who live in [redacted] and own property in the [redacted], people weren't really concerned as much with the data aspects of the [redacted], more concerned about Will [redacted] be even more busy because of the [redacted]? So that's what people were. Yeah. Most interested and curious about. Umm but yeah, but in terms of these questions on, umm yeah, which data set do we open up? Yeah, citizens aren't involved in that. And I think to some extent that's fair and some extent that's unfair. Uh, I think it's almost in some ways like the parents and the children where, OK, you have to have an idea within the company itself or within the group, OK, what are your stance on things? Where are you trying to go? And then you can kind of communicate and and get feedback from the public. So for instance from like the the datathon. So in order to host the data then we needed approval to make the data public and you don't get approval to make the data public from the citizens. They, they, can't do anything about that. That was an internal decision to make it public. And then you have to go to the Government municipality to say that it's OK, then once you're actually at the datathon you have the citizens going to access the data, then you can talk to them about OK, was this data useful to you? What are you interested in doing with it? Umm do you wish you had different data sets? Stuff like that. But I don't know if it would actually work completely, at least not with. If you're within the group, I don't think it would work the other way around, because you'd actually still have to start the circle all over again.

EM[0:21:38.510]: OK. Umm. I kind of made a jump in my questions and now I got a slightly lost. Ohh yeah during the discussion. Then within the research group would you consider that the personal views or values of the stakeholder's represented also within the project.

Int03[0:22:6.800]: Sorry, could you repeat your question?

EM[0:22:9.230]: Would you say that within the research, uh group, the personal values or personal interest of of the researchers is represented in the project?

Int03[0:22:20.560]: That's interesting. Yeah, I it's an interesting question because there is the individuals' personal values and interests. And then there's the people as they represent their specific organization. And I don't know if each individual's personal values, to what extent do they divide from their, Uh, organization like people are welcome to say whatever they think or feel in the meetings. Of course, there might be things might not be possible, either legally or because there's not as many people who agree with them, but I do feel like they are represented to the extent that people can

share their thoughts, opinions, beliefs on how things should work whether that actually happens is another story.

EM[0:23:19.340]: And then those. Uh, I mean, yeah, whatever their individual views are do you think it's related to the overall vision of the project?

Int03[0:23:32.370]: Uh hmm. Yeah, it's interesting. Yeah, I don't know. I feel like it's kind of hard to fit the question into our specific project. Umm. Because. Yeah, I don't know individual views on a [redacted]. I don't know. I guess. Could you read? I don't know if you can reframe the question or if you understand why. I'm also struggling to answer it.

EM[0:24:7.460]: Uh, yeah, yeah, I understand. Umm. Well, do you think then? They, the researchers, that different people agree with the project they are working on, like an up to what degree?

Int03[0:24:26.770]: Yes. Yeah. Umm, so I think overall, yes. I don't think people are doing things that they are uncomfortable with, I think. Our project especially cares about, umm, doing things the right way when possible, and I say when possible because you'd be surprised by the extent to which the organizations that are supposed to assist in making things "better" are a blockade, so for example uh with something like getting [redacted] That's something that our organization is interested in. We have reached out to [redacted] about it and they don't get back to us. So what do you do then? You. You've done what you can. Uh, you don't necessarily. I mean, it's also your job too. It's not like Do you want to put all your effort into this thing that maybe you don't feel like is 100% your individual responsibility? Since we're kind of going between individual and collective responsibilities here? Umm. So yeah, I feel like people do what they can and they feel comfortable with the outcome like people were were really a group that, yeah, is interested in doing things the right way and talks through: OK, what? How what can we do best for the people? How do we notify people? How can we do this ethically? What could we do better? I mean, there's things with the project that people aren't happy with. But I think with this sort of separation between an individual and collective responsibility, individuals on the project feel fine. So for example. The [redacted] There's one side that has a bit of a gap on it and it's not super accessible for wheelchair users and that really should have never happened. But the the [redacted], so the the area was like Lidar scanned. So they did a 3D scan of the area before the [redacted] was installed and the [redacted] was built for the area, then, about, the [redacted] is supposed to be installed several times. But one of the times when the [redacted] is supposed to be installed, there was a collapse of a canal wall nearby and so they went through and re-did the canal wall and it also turns out that there was some box, I don't know if it was like electricity box or something that was also kind of in the way of where the [redacted] was supposed to be, so the [redacted] had to, it wasn't placed exactly the way that it was supposed to be placed again, individual-collective responsibility. Whose fault is that when there are so many dynamics at play? And so now there's a gap and the [redacted] isn't completely wheelchair friendly. Me as someone who had no say on the design of the [redacted] itself, who came in on the project after the [redacted] was built, who didn't really design the sensor network. But I'm still a part of the project and [redacted] Am I happy that it's not wheelchair friendly? No. Is [redacted] that built the [redacted] happy? No. But they've talked with [redacted] and they're also slow and unable to kind of, you know, fix things or you know figure out how to level that out or lift up and retake out [redacted]. That's a lot of work and then messes up that whole area that's quite busy. The [redacted] is also not happy, but they don't necessarily wanna spend the time or funds. So everyone can kind of blame it on these collective problems and then feel individually secure so I can sleep at night being like well it's not my fault that [redacted] isn't as wheelchair friendly as it was designed to be. Uh, even though as a member of the group, it's something that I'm kind of like ashamed of. Like, how could that happen? But that's how these projects end up. And then I think also because of the ease to, umm, let out your individual responsibility. That's also where the inaction comes like, who knows when that will be fixed? Or if [redacted] will be moved somewhere else before before that problem is solved.

EM[0:28:55.220]: Yeah, I've also heard from other interviews that there's sometimes a stakeholder at that's supposed to be your partner and but ends up like hindering the the progress of the project overall.

Int03[0:29:11.190]: Yeah.

EM[0:29:11.190]:Has it ever happened, like with another stakeholder within your project?

Int03[0:29:17.310]: Umm, I think most of our issues have been trying to get feedback from [redacted] but not being able to. Uh, which is really interesting because they're kind of, you know, who you got, who you expect to kind of be leading or taking charge, but I think they're just really overburdened and [redacted] project is kind of weird. Like I don't think they necessarily want to be responsible for this [redacted] and public space, but then also we kind of need them to take sort of some responsibilities so that we can be a more ethical group. So that's been a real challenge for us is kind of figuring out sort of next steps. So for example, researchers are really interested in [redacted] So basically the raw data of individuals would be deleted and then you can kind of get a sense of how people are moving on [redacted] and what they're doing and they're interested in this so that you can better use the digital twin and data fusion to know what's actually making these sensors. Kind of have reactions and that process of figuring out, what are we allowed to do? How long can we do it? It's been very slow because again, I have a feeling that [redacted] doesn't want to sort of take responsibility. Fair enough. But then our group is kind of stuck. Uh, so that's. Yeah, that's a sort of issue that we have or with the signage thing. It's a mix because like I think the [redacted] that I'm on, were about more citizen, government, governance, more citizen information, if the [redacted] really is a safe, anonymous [redacted], then there should be no problem with people knowing that [redacted] collects data. Of course, you don't want to increase traffic, you don't want to stress people out, but the signage that's there's now is quite small and really just sort of on the lower corner of the bridge. And if we had design it ourself, I think it would have been a lot more visible for one. Umm. But that's kind of where you end up. Who's fault is that? Is it the fault that there aren't standards of how this signage should be? Uh, it's a company decision in the end, do we think that the company was wrong? Well, OK, our grant is also through that company. So what are we going to, umm, do necessarily? so I think it's more of, at least for me, because I'm doing research on the project, I can see all of these things as more of a learning experience, but then that goes again. Oh, I cannot be fully responsible and I, this is all just research for me and to what extent is that good or bad as well?

EM[0:32:17.860]: Yeah, I understand. You also mentioned that you want to be an ethical group, right?

Int03[0:32:25.690]: Uhumm.

EM[0:32:26.680]: For the purpose of achieving this goal, and I also don't know if it's also part of how you operate as a research group, but do you ever have discussions about the values that are being uh, put, implicitly or explicitly within this project?

Int03[0:32:47.490]: Yeah, that's a good question. I don't think we've, we, it's not like we have an explicit list of values like ohh we value privacy and we value, you know, transparency. And no, I I think it's more, we look at all of our, just, I think if you were to look through our Research Committee notes it would be clear to see that there are some values and of course perhaps some conflicting values too. So for example I think it's very clear that we value, like uh, not just like transparency, perhaps, is one word for it, but there really is an urgency or a desire to be open, to be clear, to have the government involved, to have the data stored in the European Union. Like those are all clear interests of ours and on other hand, there's also clear interest in like research and and grant funding. And yeah, putting out knowledge and and like I said earlier, for some that those might be somewhat conflicting if you want to have more of a research advantage.

EM[0:34:11.490]: Umm, OK, that's very interesting. Do you think, I mean this is slightly off topic of of the interview, but do you think you notice those values because of your background?

Int03[0:34:24.100]: Umm. Uh, maybe. I mean, I think if you were to ask anyone in our group and actually. Yeah, ask them the question: Ohh, what are your values? I think they would be able to pick them out like before you ask the question, I wasn't necessarily thinking of our values as a research group. Umm, our, we made it so long ago, but our, the whole point of the research group was to kind of ethically decide what kind of research can be done, how we decide if new groups can enter. Umm. Yeah, trying to figure out sort of the future and data sharing and governance. So it's a very sort of practical group but ethics is a part of that. But uh, you know, as you kind of noted, ethics is sort of

vague, but I do think that moral values are implied in that, so that there is a sort of hierarchy of key of moral values as opposed to, I don't know, something like profit. We're not really making any money on this. It's like a lot of sunk costs both for [redacted] and for [redacted].

EM[0:35:41.390]: And for having all of these, uh, discussions around ethics and values, do you use any specific methodology or tools to to support these discussions?

Int03[0:35:54.870]: Umm, no, we don't. Really. No. It's just more conversations. And also talking to the, like, legal counsels at the different institutions as well. Umm yeah. It's not like we're ohh let's follow so and so it's framework to sort of do the decision making here. It's mainly conversations.

EM[0:36:22.830]: OK. Well, this would be my my last question. So before we finish the interview, is there anything else you would like to share?

Int03[0:36:35.320]: Umm. I don't think so.

EM [0:0:10.870]:
Well, uh, thank you very much [redacted] for doing this interview.

Int04 [0:0:16.690]: Mm-hmm.

EM [0:0:16.670]: Umm, because we first start with a brief introduction of yourself.

Int04 [0:0:21.930]: Uh, yes, I'm [redacted], I'm a living lab developer. I was previously a researcher in [redacted]. And I'm doing research, or I have been working in since 2014 and, in the intersection between technology and cities, specifically bringing the knowledge from cities but also trying to engage people in co-creation process and creating a stakeholder agreement in the different in the different projects I have been working. Yep.

EM [0:0:57.950]: OK, yes. Sounds sounds very interesting. Umm. Then for the for this interview I would like you to ask uh, that you come. Well, you remember a smart city related project that you consider it was interesting and challenging in the collaboration with the different stakeholders. Can you think of one?

Int04 [0:1:20.440]: Well I think all, but the key of the success of a collaboration of, of, of, a smart city project, but also of a Living Lab is basically having a substrate having that success in collaboration. So I can mention one project that was called [redacted] and in that project I think that the main question was actually more about engaging and co-creating the same vision rather than developing it, and in most of the cases is the same. So also in [redacted] I worked in different [redacted] project related to smart city initiatives and one of the most difficult parts is exactly this kind of co-creation or stakeholder agreement. And here too, the the main point I guess if is this an open interview, I guess that each contact, it's each each contact has its own specificities, especially cultural. And there are some places that for example have more issues in defining the vision and some other places that have more issue in kind of executing or agreeing on the different steps that you have to do in order to to to engage in these projects.

EM [0:2:41.510]: And I think you and in the different places that you've been involved. What are usually the parties that are taking part of of the project? Does it includes the citizens?

Int04 [0:2:51.630]: Well, you can call it quadruple helix, even quintuple helix in the sense that you normally have governments, cities, anything that is kind of civil servant government related, then you have companies that have a specific call or or key economic interest. Normally it's translate research. There is the universities and research institutes that are key in engaging innovation processes. And the last one, as you suggest, citizens that are also part of accepting any type of project that is there but also providing insights, so especially in smart city initiatives about what are the relevant topics or what are the relevant elements that you need to address in in a given context.

EM [0:3:41.190]: And within all of these different stakeholders, how does it usually happen that the group decides what are the what's within the scope of the project, and what it's left outside.

Int04 [0:3:57.0]: Well, if you ask me at the beginning it was very empirical, but now after I was researcher for many years, there are set of co-creation methodologies that you can use to do so, so one of the way good ways to to perform that is to start from the needs and challenges of the different stakeholders and and and try to translate that into value propositions for each one. That's one of the easy ways to kind of shape the project, but also define what is important for each of the people and also provide, prioritize the the most important elements over others. So you can define our issue but then also you have to execute it. So it's very important that what is going to be executed is in some way also Co created so so all the people agree on the same things and all the people is happy about the different, the final results and the different stages of the development of the project.

EM [0:4:58.430]: And for example, you mentioned the value proposition model in your experience, have you used this with the different elements of the quadruple Helix?

Int04 [0:5:9.500]: Yep. Uhmm. I don't know exactly what, uh, what specific frame or you are you are referring to, but definitely in all the frameworks that I have been using, but also publish about, there is the value proposition as as a concept that is always a variation of needs and challenges so I don't know if it's your specific framework of value proposition or not, but it's definitely what I have been working as a researcher in in in Co creation frameworks.

Int04 [0:5:41.110]: OK, then it's we're probably talking about the same framework, just with a different name. And then during this process of having these conversations. How do you deal or how is it managed? The fact that you have so many different views within the diverse group of stakeholders?

Int04 [0:6:4.660]: As I as I mentioned, you will find that what is the value proposition, so it is clear to everyone what is, what are the common points and what are not the common points. So that's that's one of the key elements. And secondly is is it's a it's a lot about. Umm. Iterating a lot, let's say, so it's not interview one to one, but it's actually more trying to kind of go through the same innovation process at the same time with all the stakeholders. Because sometimes what, what is the main problem are not actually the ideas or the goals, but is that different people is at different stages of, or have different stages respect to the project, maybe preparation but also it's, it may be exposed to different ecosystems. So it's really good to try to engage in the set of activities that are recurrent, so people kind of start maybe with some different ideas, but they start to kind of align in the process on the same goals. And so it's very important also to define the roles of the different actors. So some actors do not like to have an official defined role. But at the same time, it's kind of good in this process also to kind of define, uhmm, what is the contribution that is expected from each partner in order to achieve that result from the project. So that's also key.

EM [0:7:29.530]: And within that process of defining what's important and what's not, UM does has it ever happened that there are conflicting views between the parties?

Int04 [0:7:39.100]: Always. Always.

EM [0:7:40.470]:And how do you deal with this?

Int04 [0:7:41.390]: Yeah, always as I explained, you start from very conflicting views from different parties with very different needs and challenges. But actually what you do to the process of co-creation and prioritizing and discussion and sometimes you can even use technology as a way to, for example make decisions more data-driven and that's, that's a very good way also to to to gain consensus among the different parties. But it's always, people always have different technology readiness or different goals, so there is always disagreement with your set, with your project. So I actually I have never seen a project with everyone is aligned and everything works fine, never. So it's, it's a process. It's a very painful process. It fortunately there are many frameworks that actually guide into that process. But the yeah, I think that always in my experience in the three or four and more projects that I have been working, there is always that no matter which culture, no matter which country, no matter what is the end goal, so always.

EM [0:8:51.960]: So are these, uh, these process of reaching the consensus? Is it mainly just through conversation and discussions?

Int04 [0:9:1.410]: No, no, actually, no. That's a not really good way to go. And that you need to, is better if you want to achieve better results, it's better to avoid conversations and actually try to come up with something that you engage the stakeholders about the topic and not like in a free or that free conversation that says so. It's useful to, for example. The workshops, use boards like, I don't know preparate like MIRO boards and canvas that can allow them to have a discussion with a specific set of goals and methodologies. So you know that at the end of the discussion you will have concrete outcomes, but also concrete agreements. So I think that is not only free conversation, what what promotes that? No, I mean you can do it in this way, definitely I did it in the past but I will not recommend it because it will take much more and then the discussion can go into another place where is good really to focus on that.

EM [0:10:5.490]: OK. Yeah, I'm for example this middle boards or if you are doing it in person, what would be your recommendations of what works best to reach this agreement?

Int04 [0:10:17.930]: It works best for, to provide examples. For example, when you start the project. So to give “in the context of this collaboration” “in the context of this project, what are your challenges?” And it's a very, very explicit of the person role or the company role so people can provide exactly the feedback and the conversation don't go too generic or too specific, first. Secondly, try to ask questions but impose less ideas on the people. So really as you are doing for the interview, facilitating more than actually providing the personal views. And given limited amount of time, sometimes it could look that maybe the first ideas are not as good as it was. But this is kind of the process. So you give people a set of numbers of post-its, for example, or of ideas that they can actually give. And also I also normally if there are many stakeholders or many ideas, it's also good, for example, to allow people to vote and prioritize the main things. So that's also important and and also ask people to to expose why this most voted idea so why they propose that specific idea respect to another one. So I think that these are my recommendations, keep it be tied to the time, ask people to prioritize them both for the most important, be clear about exactly what you want to achieve. I know, so provide examples of the type of answers that they could give, so they they have already a guide on that. These these are my recommendations and there are one cultural that actually is very important is that for example, Italian, Spanish and other type of Latin people they tend to do like very long speeches and be very engaged in the conversation, so you have to kind of cut them and be trying to put it in a very concrete way. But if you go to more northern countries, it's actually the opposite. So both servers are very good way so they they can express themselves more easily through Post-its. And also it is very important to call them so to try to engage them into the conversation actively because they are not going to provide opinions without b eing asked so [redacted] as a culture. So there are, in that way there is a difference in the execution, yeah.

EM [0:12:47.740]: And within this difference of the people involved in this. The. Yeah, well, in any multi stakeholder collaboration, does it ever happen that they bring not only their organization views, but also their personal views?

Int04 [0:13:4.450]: Yep, they do that actually. But actually what you do is that. That's I mean, that that you ask about the organization mostly it's interesting to know what they are interested, but at the same time because you need the organization to be engaged, is is very important that the key elements of the organization are introduced and aligning to the project. Then you try to see how you can link that to the personal interest, but at the same time I will say that is more important the organization to manage the success of the project because otherwise if you engage in the personal views of the person, the person maybe will not have time to be engaged in that project, that person will not get the [consensus] internally. So it's something that in a multi stakeholder is is not something that we should engage into that that's that's more on the person to try to align their goals or things like that. What you can do is maybe if you see a project proposal that kind of go in that direction, you try to introduce that person to that, but in general for a successful multi stakeholder project you you definitely need to align with the goals of the organization and and there is no time because of the complexity and the scale of the multi stakeholder to to to really focus on the personal views as as inputs for the project. I mean personal views not aligned to what the organization wants, I mean.

EM [0:14:45.90]: Yeah, that, that, that makes sense given the the complexity of the projects.

Int04 [0:14:50.420]: Yeah, because you have different scales, you know? So in my organization, I try, but everyone is aligned aligned in their personal goals with with the organization and the organization wants everyone is aligned with their goals. But when you are mediating in a multi stakeholder project, is not, is not your role also to try to change the internal organization or to try to support people into is is not is not that about. Of course these people should find energy and emotion but not necessarily related to their personal views. But it's more trying to find things that provides energy and interest to people according to the goals of the organization.

EM [0:15:34.970]: OK. And within the process of all all of these collaboration, umm, does it ever happen that even if everyone eats targeting the same goal in the long term, that meanwhile they have conflicting views on the topic? Or maybe their visions doesn't align since the start?

Int04 [0:15:55.930]: No, in the start the divisions that doesn't align in the start always, most of it. So they have like a maybe a generic idea that is aligned. But in details or when you start like the general definition that you start to see that there are not alignments. So you need to work on that. And in the middle of the project, actually if you set up very good and your goals and challenges and you. Let's say, how do you say that publicize or talk to people, actually to make sure that you you need to keep monitoring that and also part of the, for example Living Labs and co-creation methodologies was about testing in the middle, so your stakeholders are always engaged in providing feedback and input for the future redevelopment of what you are doing. So it let's say that I developed the first prototype, you will call end user but also you will engage your stakeholders into providing feedback about the the current state and what it needs to be done after. So in some way that these are the middle disagreement is kind of fixed by that in the sense that you are kind of passing into a, reshaping part in which you prioritize again things that need to be done and perform in order to go to the next phase. So, that's the way that I guess that it happens, but it probably happens always. But if you kind of do cycles is is not that difficult to manage.

EM [0:17:26.180]: And and during those iterations, do you also make use of middle boards or any other tool?

Int04 [0:17:33.340]: Well it depends on the situation. If you are doing more like a tech project, yeah you you can use MIRO boards. You can also, for example once I work with blind people so MIRO boards were not an option. So because MIRO is super visual so you have to kind of go with one to one interviews. It depends a little bit, so sometimes it's more testing. So if you're testing with a lot of people, maybe you need to kind of have surveys that give you hints on a more general way of the results so, there are different methodologies it depends on little bit what you want to do and what do you want to test and how do you want to proceed so I think that is not always MIRO and not always canvas.

EM [0:18:29.170]: And then how do you how is the process within the the research team to reintegrate those those learnings from the feedback?

Int04 [0:18:40.640]: Well, that's that's quite easy actually, because you organize this activities or this questionnaires or this one to one so you are focusing on testing the different aspects of what you are doing. If it's software, it could be for example, for stability, acceptability, transparency, other type of aspects. So you go very specific on the details. So you you come up with the suggestions about what it needs to be performed and then you prioritize what is most relevant and what is not relevant according to the difficulty of execution and the relevance that it has for the different stakeholders. So time, time-value and then you define and prioritize. And how do you [skip anything] you need to know what you're doing. So try to kind of test different categories depending on what you're doing. If you're doing technology, there are certain categories that you can test. If you're doing experiments there are other categories, it depends a little bit of what you are doing, but you have to be careful to not forget anything that is important and go over organized in terms of defining your categories and your. You're that. That's it.

EM [0:19:51.610]: And then would it be the same if you're working with a group of citizens that may represent different visions? Individual visions.

Int04 [0:20:0.720]: It will be very similar, maybe what what it change a little bit is the type of language that you use. So for example you different stakeholders have different type of language. So if you engage in workshops of Co-creation with very technical people for example, you need to kind of make it more technical, the same questions or the same elements to make it more appealing to them, but also maybe to gain more insights about that specific view. But for example, if you're talking to citizens and you want to validate that the sources to use in a project or something like that, you you don't, are not going to talk about that the sources to old people because they don't care and they don't understand. So maybe instead of talking about that the sources you just talk about trees or you talk about benches or you talk about what is represented in that specific technical element that in some way has an impact in the city or in in their environment that they are living. So with citizens, I think that is try to translate those requirements or questions into relatable things that they experience in their everyday life, which is good because at the end what you're looking is the vision of the citizens as as

end users of most of the things. So it's it's quite important that you kind of put them in first person in front of what you are doing. So even if it's a very complex technology or is data is really try to test what is what is visible and what is relatable to their daily life and their activities.

EM [0:21:43.860]: And within all of these conversations and analysis that you do the of the information, does it ever come to the to human values that discussion?

Int04 [0:21:57.20]: Again.

EM [0:21:58.80]:Uh. I mean, during all of this analysis, does the discussion ever comes down to the interpretation of of human values?

Int04 [0:22:12.40]: But human values. Can you rephrase human values more specifically because there are many different things that could be derived from human values, so.

EM [0:22:22.720]: Yeah, like for example, if the discussion, uh, if we're talking about smart cities, then uh, does the discussion never focuses on privacy or transparency and the individual opinions about that?

Int04 [0:22:38.500]: No. Translate privacy and transparency is not really it's it's by law. Something that you have to do. I understand privacy. Transparency. No, never because transparency is some, I mean in some way actually the problem with transparency normally ismostly the lack of capacity of explaining what they are doing. So for example governments are very scared about reaction of citizens related to technology. But the problem is not that actually the problem is that the normally this technology is not well explained to people. So people don't know what are the privacy setups or how the processes are done in the project so is not really about that, so it's normally tends to be more about explainability than actually anything else. But. I don't know if you're talking about the same, but there are political views and values that are different, and if you're working on multi stakeholder project, there are some agenda, interest and in in the different projects I have worked on you need to kind of also prioritize the impact of your project. So I, is, there are certain topics that you know there are not part of the discussion of the agenda and if you want to be successful in the implementation of the project and maximize the impact of what you are doing, there are some topics that is better not to engage to because you know that this is not the scope of the project in the sense that you have to pick something that will generate a lot of value for everyone that will create a social impact and things like that. There are certain topics that are quite difficult to to touch so that in that I tend to be careful also because when you are in a multi stakeholder group is is very complicated to do with that, so maybe you wait until the next government or something like that to work on on those topics or depends on the type of project you know. And there are also other topics where there are differing visions, but actually people is just maybe other visions because people has not been exposed to that topic enough. So they don't know. So in that instead is more like an individual work towards changing the different about a certain topic or or things like that. But it's not, it is more is is during the project that is happened and is like that.

EM [0:25:25.110]: OK. Yeah, that that's very interesting. And going back to the this political values that you mentioned. Are these discussed within the the research team or since the stakeholders are like, since you are now, or deciding who's going to be part of the project, the discussion it's also hard to think.

Int04 [0:25:48.330]: But you normally don't decide who is going to be part of the project. At least it never happens to me when normally you are already in an ecosystem and this ecosystem is multistakeholder so and that's one. Uh and yeah, so so that's one of the things that you have to be, I don't know it in your case, but in my case in the multiple smart city living labs projects that I have been working, I have never decide the ecosystem. Maybe you can integrate one partner or things like that. But it's not that you define that too. Also, because there is one country or one region and and that is. Regarding the personal values or views, this is normally not discuss it openly and, but for example I don't know there are, you know it, people will let you know that in different ways, different stakeholders will let you know that. But again, I I'll give you the political legend, the example, but it could be the same for companies. So it could be the same for research institutions that are focusing in

one topic because they have a specific technology. So don't, don't, don't don't mention in the in the interview that is on the governments because it's not true, it could be.

EM [0:27:25.440]: Yeah.

Int04 [0:27:14.490]: It could be something else. It's just that people may be focusing on one thing or also people do not believe in that or have different values, which is part of the process. Also at the beginning I was very frustrated by that. But then with years I learned that if you want to achieve something important and leave something important in a project is is very important that you try to do something that is nice, but also that everyone is on board on the same thing.

EM [0:27:40.520]: Yeah, I just went for the politics, right, because I think it's s sector where their visions are barely clearly stated of what each group believes in, and it's in support of, well, maybe a company maybe slightly more vague or ambiguous on what they are promoting.

Int04 [0:28:4.230]: Yeah, but when you do the value proposition, you get what they want to do. And so you focus on that. Basically. And if there is an elephant in the room, probably the project development will put that on the table. Sooner or later, it will become busy also. You let the project do the job.

EM [0:28:28.50]: And for example, if as you mentioned, there is an elephant in the room. What's the in your experience? How would you address this situation?

Int04 [0:28:39.760]: I will be progressive, so it's not that you see the elephant in one view but you will start to slowly see pieces of the elephant until it's very clear that the problem is the elephant so. It's so progressive that I don't think that is even a problem, so you have to tackle it and it's so clear for every stakeholder that no one can say no, there is not an elephant in the room.

EM [0:29:4.280]: That's interesting.

Int04 [0:29:5.100]:I don't know how to say, you assume that there is not an elephant in the room. You start to work towards the project and towards the thing and this elephant start to reveal itself through the outcomes of the project and the different stages. So. That, is not my role to say that there is an elephant in the room, is the results of the project that will show the elephants in the room in the different stages.

EM [0:29:30.570]: Then, uh. If it says the project progresses, then this. Yeah, I think the the metaphor of the elephant in the room is quite accurate. Then is it just talk through the through the project discussed during the meetings or do you also have a specific codesign stations to to address those maybe conflicting areas?

Int04 [0:30:3.170]: Can you repeat it again?

EM [0:30:7.370]: I mean, in your experience, uh, once you are aware that there may be an elephant in the room, would you is it just address during the meetings, like during conversations or would you also plan on specific workshop to work on that topic?

Int04 [0:30:24.430]: Depends on what is the elephant in the room and depends on how it reveals. But many of the time when you're talking about an elephant of the room, you know that the elephant is in the room, but you let the project and the process to reveal that this is an elephant in the room. So when whenever you want, there is a moment when everyone is aware about the elephant and they realize that the project has to do something about it or they should be another project about this or something like that. So I do not take the ownership of the elephant. I let the elephant and the procedures and the frameworks and methodology to reveal itself, so it would be not my role to say to anyone. Now you know, there is an elephant in the room or but they will realize ohh, I notice that there is an elephant in the room. I'm like, wow, really oh amazing. And then you start to just talk and they start to realize that and maybe the project itself would not solve the elephant in the room. But they start to talk about other projects that could solve the elephant in the room and things like that

EM [0:31:26.760]: That's very interesting. Umm well, I actually think we have somehow went through all of my questions and all the topics. Umm. Then I'm just going to go back on a certain topic that has also come up with a with other interviews, which is the the initial stage of the of this projects. How is it agreed upon what's going to be the main area of the of the project. For example, I've had a I've heard of some examples, yeah.

Int04 [0:32:7.290]: Yeah. No, no, I understand what you say, but it depends a little bit because you can for example. Uh, find an European call and then that is about a certain topic. So you already start from something and get stakeholders and maybe define more in concrete [what does it means in concrete? A little] bit more to the proposal. So that's one. Secondly, there is a country, there is a city or there is a place that has an issue. There is a set of stakeholders or top down decision that it says you know, let's do this to generate this ecosystem and that that is the way that it starts so. […] And and and so you always have the the general topic that you want to tackle normally or this domain and how a little bit so is not, is not about defining “we are going to do a chair or a tree or something like that”, but it's more about defining the domain of chairs, how we want to do this and maybe let's define the specifics and who does what basically. So it's very weird that you have first ecosystem without any topic. Normally you have a problem and issue an idea or something that starts and engages the ecosystem into something so never, never happened to to find a group of people like, OK, let's do something. No, I at least not in my experience. But maybe there is someone who who? Who has that too. But to be honest, I. […] There, there is always something that initiates the stakeholder engagement and the selection of the stakeholders.

EM [0:34:9.860]: And for example, how do you do this selection of stakeholders?

Int04 [0:34:14.510]:No, no. No, I I can’t. I mean maybe in the European projects you can kind of more or less select your partners, but actually normally you you get invited to an ecosystem. So especially Smart city projects or living labs projects. Your ecosystem is already defined, so it's not that you can. You maybe can call another city, but normally you have kind of default ecosystem. There are some that can be added other that can be removed according to what you want to do, but is not mine the decisions and definition of the stakeholder so. At least for myself, is is very is very strange that that happened. Maybe if I was not doing this job for creating a multistakeholder, but I was more like a another job role. Maybe my role was basically to define ecosystems and stakeholder groups, but that that's not what I what I have experience so far.

Int04 [0:35:22.450]: OK. Yeah, that's that's interesting. From the different interviews, everyone has their own way of defining uh or explaining how they came to be in that project and somehow someone took different decisions in the process that they ended up there, so it's interesting to see how it happens.

Int04 [0:35:42.870]: That's basically my thing and also sometimes you have one stakeholder you are tackling one problem and there is only one stakeholder than it’s engaged with that project. No, no, I mean not only in the multi stakeholder, tackling that specific field or domain or doing that specific role, maybe there is just in the whole ecosystem only one stakeholder that can do that. So it's not that you have any options to choose, but you have to work with that stakeholder, and sometimes that that's also very painful thing in the multi stakeholder way because you have only you have kind of a monopoly of that specific stakeholder that has to be engaged in the project which is more difficult.

EM [0:36:29.570]: Yeah, interesting. Well, before we conclude the interview, is there anything else that you have in mind that you would like to share?

Int04 [0:36:42.80]: No, I think that I shared everything that you ask from your questions. I'm not really sure if there's something else that I could tell you many more stuff about other stuff, but I don't know exactly.

EM [0:36:55.790]: Well, anything you consider relevant for me to know for multistakeholder collaborations.

Int04 [0:37:5.290]: Not so far, at least from your questions, I think that is that.

EM [0:37:9.910]: OK. Yeah, that's completely fine.

Int04 [0:37:12.290]: Maybe what is? I'm interested because, I work in a living lab. We work with a multi stakeholder. I'm very interesting on the report or the work that you are doing, so the outcomes of these interviews and see what are your main findings about this. So I don't know exactly what is the context of this research that you are doing now, but I'm I'm more in. I'm very interested in understanding first what is the context where you are doing what you want to achieve. And secondly, what is intended to be in that report and and when you can share that report with me, because I think that is quite interesting to read.

EM [0:37:50.830]: Yeah, well, I can explain a bit of the background of this interview. Well, I'm doing my masters in industrial design engineering and for my master thesis. Well, I decided to focus on developing a tool that will support these, uh, multistakeholder collaborations. Uh. It's focused mainly on the initial stages of the of of a project, whether where you are doing this framing and defining the scope and the boundaries of the project and how. How to support the discussion of of values, whether they are individual professional organizational values, because they are there implicitly or explicitly, they are they are there and are part of the project. So from what I've learned from the theory, and also from from the interviews, is that you always have this these conflicting views, but they are not always addressed, which if you left the leave them ignore. And as we were saying, if you just keep ignoring the elephant in the table, then later on it can create some some issues whether the the project is published or or. Ohh it's executed.

Int04 [0:39:13.490]: Yeah, but if you know how to frame the elephant in the room, I think that the project itself will tackle on it. It's very important to know. I mean, if you are the facilitator, the creator, the creator of the framework, whatever. I I think that is very important to to to shape the project in such a way that it will make clear with the development that there is an elephant in the room, I guess. And so I'm not really sure on the second thing. Yeah, it's different values, but of course you have to focus on what is your goal. So if you, if my goal is to improve mobility and maybe there is a delicate elephant about one set or one specific topic related to mobility. I will work for mobility, but also the results of this work will show that elephant in the room sooner or later. So, but at the same time, you have to pick your impact in the sense that if you focus on the elephant in the room, you will never get consensus. You will never do your project, you will never achieve anything. Instead, with that process of thinking, it will be more easy to tackle. Eventually, the elephant in the room. I think so. I mean, at least from my very for my empirical experience, but also from the research that I have been doing. So it sounds very patriotic at the beginning, but at the end, if you want to create something nice and leave some impact and I think that is good that you you you pick your winners, let's say, and you try to kind of do the best that you can. That is part and then agree value proposition for everyone you know.

EM [0:40:53.780]: Yeah, that's kind of the end goal because I want to create a toolkit so. I still don't know if it's going to be physical or digital, but something that you can have during this code is sensations or participatory sessions with stakeholders with from the different areas and that you can have this discussion not to reach a a full consensus. But the fact that you can have these discussions and be aware that even if they are conflicting views, you can still go ahead and tackle the problem.

Int 04 [0:41:26.670]: OK, you can check my paper. There is is is really about you said using participatory design methods for age friendly solutions. Umm I published it and and there is a little bit about my experience in one of the European project of how how how do you do this Co creation process since the beginning and collect the requirements and develop solutions for that. If you're interested.

EM [0:41:54.490]: OK. Yeah, I will. I will check it. Yeah. Thank you very much.

Int 04 [0:41:56.960]: In in like more, I don't know, if you want to read my paper but but really what I told you some of the things that I told you is part of that and my previous boss she is is really into inclusion in [redacted] and, but, she also had a lot of interesting frameworks and methodologies for creation, especially in topics related also to to inclusion. So I think that that could be interesting for you. And also I don't know if [redacted], maybe there are there is a lot of literature and a lot of frameworks or really try to go through because I know that you want to do this, but there are already a

lot of tools to do so. So it's very important that you kind of know that. So you come up with something different.

EM [0:42:44.640]: Yeah, I don't wanna just do another one.

Int 04[0:42:48.230]: Exactly.

EM [0:42:49.160]: Yeah.

EM [0:42:51.640]: Uh, then? Uh, the name you were mentioning of your previous boss is that in the paper that you shared?

Int 04[0:42:59.140]: Yep. And she's called [redacted]

EM [0:43:2.400]: OK.

Int 04 [0:43:2.570]: And you can check her and she has a lot of publications, but there is a lot about cooperation and living labs there.

EM [0:43:10.460]: OK.

Int 04 [0:43:10.600]: I know. So I kind of. I'm kind of also it's very interesting we have in the [redacted] and we have a set of tools of canvas that support people in creating business models but also developing developing the idea and engaging procreation. So maybe check that on our website because there is a lot of living labs methodologies and things that. But maybe also be interesting for you to to check.

EM [0:43:45.80]: Yeah, I've. I've been through the through the website, but maybe I need to go back again.

Int 04 [0:43:51.40]: Well, let me see if I can give you some names, but this is more about….the check, for example, yeah, there are some manuals. For example if you see or believe loves to meet perspectives on impact or there are like a podcast and there are different kind of elements we have. We have set of tools and changed but but if you check well in our website in the part of living labs and other sites there are you there are the links already to that. So maybe you can already see this.

EM [0:44:44.80]: Yeah, I will definitely go through them.

Int 04 [0:44:46.490]: If you want to, I mean.

EM [0:44:49.310]: Yeah. I mean, uh, all information is useful so.

EM [0:0:5.30]: Umm well, thank you for agreeing for the interview. And now just to start, could you give me an introduction of yourself and your expertise?

Int 05 [0:0:16.500]: Very sure. So my name is [redacted] and I work since one year for the city of [redacted]. I work as part of the public tech team here, which focuses on the use of technology and public space and my main emphasis is on thinking about the ethical implications or the moral implications of our work, and to guide the teams to make sure that these moral implications are part of their considerations in their design and the way they think of the project and possible outcomes of the project. Uhmm and I got here because I was working on a manifesto of ethical values or moral values. Uh. The manifesto called [redacted], which was made with the whole coalition of parties here in the city of [redacted]m and was also embraced by the coalition of parties that are now the government, local government here in [redacted]. Yeah. And before that, I worked at several companies, in other organizations always on the topic of digital rights and public space. And in general, just like the let's say the coexistence of technology and society in a very broad sense.

EM [0:1:34.940]: Well, it sounds very, very interesting and very related to the to the topic of my research. Umm. Out of all the projects that you've been involved with, perhaps we can start by discussing one of them that you consider where the multi stakeholder collaboration was challenging or maybe was really interesting.

Int 05 [0:1:57.760]: Yeah.

EM [0:1:57.380]: Could you perhaps think of a project?

Int 05 [0:2:0.360]: Yeah, I was glad you asked me this question before so I could think a little bit about it. I think the topic with our the project which was the most interesting in this regard and it's still an ongoing project, is the collaboration between the city of [redacted] and the [redacted] and the [redacted]. When it comes to the area around the sort of the big public [redacted] in the [redacted] [redacted] beyond the [redacted], they are they they considered it like a public field lab, you know? And it's it's a place where a lot of technologies are being tested in, in the public space. UM, and I think it's interesting because of different stakeholders. So a [redacted], a private company, basically; the local government, and also the national police. And they all come from very different angles, they share the believe that it's good to have a real physical space to experiment with new technologies. But I think they also have very different, uh motives and interests in in doing so. And these are not always so clear.

EM [0:3:17.210]:And for example in this project, how is it that it came to be? Was it started with one of the parties or maybe a grant?

Int 05 [0:3:26.350]: When it comes to, of course, this kind of large scale places in society like a football stadium. These partners are already always there, you know, it's, yeah. Yeah, it's partly the physical infrastructure owned by uh by a private company that's being exploited for football games or concerts. It's like a, it's a party that's always there because of the effect the stadium has on the city. The local government will be involved when it comes to things like transport, but also the city of [redacted] is a big stakeholder in the [redacted] and of course, as we all know that putting big crowds of people together and especially football fans, always have a security angle to it, so that is why the police is also of course there, I think that, so so that this cooperation is multi stakeholder and there's there's smaller stakeholders also involved like research stakeholders in this kind of things and technological more technology focused stakeholders like [redacted]. But the big ones, [redacted] police and [redacted] is a very natural collaboration. And what makes it little bit special, and this is that they're, in this field they all share a desire to innovate on the way they collaborate and innovate on the way they deal with the space that is their shared responsibility.

EM [0:4:58.400]: A really, really interesting. And for example. At the beginning of the of the project of the collaboration. How do the different partners agree? What to focus on and what to disregard? Maybe temporary temporarily, or to focus on later, but how do you do that initial school?

Int 05 [0:5:20.480]: So maybe maybe it's a little bit of a disclosure. I was not part of the beginning of this project. I only came in later. When a lot of the collaboration was already underway and also because, like I said before, the the collaboration is already a natural collaboration that has been there for decades, I I could say, but when it comes to more the, the, the experimental, making it into a field lab, the direct reason for this was that [redacted] was gonna host the [redacted] and the [redacted] is a very powerful uh. Yeah, I said. Organization. Of course, in the world that has a lot of demands towards cities, say like how they should organize it. Uhm and one of the a lot of the demands have a lot to do with security. And, for instance, the [redacted] kind of demanded from [redacted] that a big wall would be erected around the [redacted] for safety measures but the city of [redacted] was very reluctant to this because they said, well, the the space around the [redacted] is not only used by football supporters or people visiting the [redacted]. The space also contains stores. There's people living there, there's a lot of people passing by to, you know, it's like a commute place. So if we put like a physical order, it's gonna disturb a lot of the people also using this space for other reasons. Uh, and then they thought this is a nice opportunity for innovation to see. How can we achieve the same amount of safety that [redacted] requires, but by technological means so and they call it like the digital parameter. So the idea is that you would erect a digital wall kind of in a digital safe zone that is constructed with various different technologies that somehow work together or not, you know. Yeah. Like a facial recognition cameras, weapon detection, Wi-Fi systems, different kinds of gatekeeping with with sensors, and also measuring the amount of people by using the data from the trains or public transport around. So there was this whole idea that by putting all these systems together in some kind of huge test report, we can get an overview of what is happening on the ground. Maybe we can also do interventions in the public space that would guide people to a different zone if one zone is getting too crowded. And by using all these kind like a whole mesh of different, uh technologies, we can reach the same level of security that [redacted] requires from us. And this went quite far and there were a lot of technological researchers also involved. But in the end, the Cup didn't happen because of Corona. So that's in the bit of it down there. Does that answer your question?

EM [0:8:17.290]: Uh, yes. For example, during the development of the project, does it ever happen? Given that there is such a diverse group of stakeholders that there are conflicting views on the on the project

Int 05 [0:8:32.520]: Yeah. So I think that that is where it's interesting is that, I think the drive to work together it is quite important. Uh for all stakeholders and the technological advances can be made are deemed really significant so that any differences are quite often kind of a little bit ignored. Or put it under the carpet in order for the project to go forward. Umm and. Like I when I came into the project so my my point of view was to point out like So what are the values that are really the reason why we do this in the 1st place? you know? So what is the moral reason to do this? And it turned out that that all parties are very, find this very difficult to articulate. What the moral values are in the in the sense you know it's. It's quite often so it's better than a physical wall, for example, you know it's. Why is that better than? If it? What's what's actually wrong with the physical wall and and still having a digital wall, these they grasp and I find really difficult to explain. And I also tried to, you know, confront him a little bit, for example, in this example, saying like, you know, if a physical wall, although it may be ugly, is it technology that people understand? You know, it's something you can relate to. You can maybe even spray paint it or you can put a letter against it and climb over it. It's something that, as a real natural person and natural world, is something that we have experience with already for decades or hundreds of years. Where a digital wall is invisible. I don't even know it's there but the moment I get arrested or somebody stops me from your security forces, I suddenly realized there was a wall. No, but I cannot relate to it. I cannot object to it because I can't see it. And. But taking this kind of considerations into account, I found that it was very difficult for the parties involved. And I think this also had to do with time pressure, you know, because the at that time, we still thought that the the football match was gonna take place. And there was only a few months left. So then there's not so much acceptance for people who try to complicate things like me. That's uh, that's not so. Yeah, people are not really open to that. And that's. And like you said, so they it also prevent it from finding out that maybe the Johan [redacted] has like a very much a marketing effective, you know they they they wanna be put on stage like the most innovative creative [redacted] in the world. The [redacted] wants to make the [redacted] happy. You know there, they wanna show that they can have like, a a [redacted] [redacted] inside of their borders and and arrange it. Everything goes fine. The national police just is like, oh, this is a nice place where we can experiment with technologies that are actually forbidden for us

to be used in other spaces because they don't have, like a real lawful basis to do this. But because the [redacted] says it's fine. They are can kind of like hop along. And then maybe they can use these technologies in other places in the Netherlands afterwards, so they're all there with different interests. But these are never, like, made really explicit.

EM [0:12:7.260]: And when when you have these conversations with them about this, yeah, the moral values and and implications of it all. How do you manage those those situations? Is it an open discussion?

Int 05 [0:12:22.550]: Yeah, we tried but it's, it's kind of like an open discussion, and people also acknowledge that there are shortcomings. Uh. But they don't feel that there's a lot of opportunity to do something about them. In order, the train is very much going to where it's like we have to be innovative and we have to show the world that we can do something different and the other things they find complicated. So for example, there was a whole debate on inclusion and connection with the neighborhood because there's a lot of people live there and you have to [redacted], where a lot of people and they said like we do want to involve the people living in this area to be part of the project and to get their views. But the way they did this that they just they published like the e-mail and the phone number on the website and saying something like if you have questions you can always call us and then in the end they were kind of said yeah, but nobody calls us you know we are here, they can ask us questions but they they they don't call us. So they're probably not interested you know they don't care. Umm. And then when people have actually some experience in community building and how do you engage with the neighborhood told them like, well, this is not how you should do it. You know people you should go towards them. You should go into the area of people and and maybe organize like a meeting there and and make sure that you are in context with the different. Uh important figures in that community, you know, and and really built on a connection then it said, yeah, but that's really a lot of work. And we don't have time for that. So, so they, they they acknowledged the problem. But they they're not being inclusive and they're not. Uh, having people participating, but they don't wanna make the efforts to really have this happened. And I think this is like a a problem and maybe also in multi stakeholder groups is that there's one focus on one project and all the other things that come to it that everybody kind of knows that you should be doing, is, they they fall between the cracks because they take too much time and nobody really feels responsible for them.

EM [0:14:49.20]: That that's very interesting. So the disscussion goes on about the the ethical implications. And is there any, I mean and I'm speaking out of ignorance on how these projects are developed here in the Netherlands. Umm, is there any way of accountability because of the implications that you have later because of of the team not having these discussions about ethical, ethics?

Int 05 [0:15:24.60]: No, not really, no, not yet. Uhmm when it comes to technology there are still some kind of weird, uh, exception in, uh, yeah, I think in the world, like a lot of people don't really understand it like that. That's technical, technological decisions have moral implications. Like of course, for a lot of other things, if you if you want to build something in the Netherlands, you have to have like a full report on the environmental effects of what you're doing and all kind of that. But yeah, for the moral effects and accountability, it's kind of difficult. And I think it's for two reasons, like, one what I just said that the the lot of people still think that technology is kind of neutral. Uh and uh, and there's a lot of faith in the solution and some kind of mindsets that we know from uh, from Silicon Valley. You know, you can fix social problems with technological means. You still have a lot of people having little blind faith in that. But the other one is also, uh, what do I wanted to say? Oh yeah, because it's innovation, when you got something innovation and a test lab or a field lab you kind of built in the possibility of failure. Because, and maybe that's also not so bad. Then you're like you're doing research and you're in academic environment. If everybody in academia would only be able to do experiments and research that they know on forefront that it's gonna succeed and gonna be a big success. Yeah, you're probably doing marketing, not research, you know. So in that way it's it's also correct that you set up if you're doing something innovative that it could also fail. But there's also the democratic discrepancy in there that if you do a field lab or like a test somewhere in a laboratory they're like or like you're doing your research very rightly. So you ask me before for my permission to do a recording of this. How are you gonna ask people for their permission to be part of your experiments when it's in public space and there's like 20,000 people passing by every day? And also

there is it like a big issue there and, yeah, especially when it comes to the police and the and the city who have like this public responsibility. You can't just subjugate your your citizens to to random tests, you know, without them being part of understanding what is happening. Why are we doing this? And that was also maybe related to the the deficit I I touched upon before you know how do you reach out to your audience, how you reach out to your community, how do you make a part of your experiment in the sense that they really know what's happening? I think this is also in general a problem with uh, a living labs, as they're often called. You know, living labs like a laboratory and in a public space.

EM [0:18:25.800]: Yeah, I would agree. And then going back with what you mentioned about the, the [redacted] [redacted]. Could you maybe share a little bit on how this come to be like how was the agreement that this is the least of principles that we are advocating for?

Int 05 [0:18:44.800]: Yeah. So the. The. It it was an initiative by the [redacted], and although they sound like an economic institute, the are really not like that. They're more like a network institute, so they they connect all kinds of parties in [redacted], research parties, governments and companies and they try to bring topics to the front that I think will be relevant in the next 5 to 10 years. And in [redacted], they said like, OK, we see over and over again that when it comes to the use of technology and data and the city, so it's an issues arise, certain values are again and again being put under pressure and these are the values that come to mind are like inclusivity or, governments not being able to be open and transparent about how they deal with people's data, the legitimacy is is undermined by, Uh, by function, for example, you know, a data set gathered for one reason and one point of time is being used for something else entirely different in the next point of time and nobody is able to explain why or or how. So the list of [redacted] really was gathered by by a group of people connected to them, some economic boards that said, like we see that these values are like there's a lot of values that are of course are important in the city. But these values time and time again seem to be mostly in danger of being damaged when it comes to technology and data use. So that's why they're mostly use these.These values and that was just before the [redacted] Uhmm, and there was a little campaign before the elections in 2018, for example, there was like, a a big debate between [redacted] in [redacted] about the digital city and about the the the the opportunities and the the dangers of digitization in the city and it came, it became very apparent that it actually all don't have a clue. You know, most of the parties just have no idea what they're talking about. And then there's this, like, almost schizophrenic approach to data and technology is everybody saying like if we want to battle the big challenges of the future like climate change or now energy crisis and all this, it cannot be done without technology. Technology is everywhere. It's coming for us. Everybody is on their smartphone. And then when you ask them, OK, so technology is everywhere. And how should we treat it? Like, I don't know. So this is there's this schizophrenic thing in politics, you know, if if you ask people what they think of of the the schooling system or of the way system or transport system, you can have like a whole umbrella of political thought and theory about it. But when it comes to technology, it's just nothing. So this embarrassing debate in [redacted] I think led to a lot of [redacted] realizing like, OK, we really need to do something about this. This is becoming a little bit embarrassing. So they put it more on the political agenda and we had the 1st. Alderman of the digital city also installed after the elections [name] and now in the second period, uh after new elections. Uh all this was prolonged so we still haven't. It's a different Alderman now, but it's it's still continuation and we see that the topic is kind of growing not as much as I think it should, but yeah, that's the [redacted] and mostly what we're doing now or what I'm doing is developing, Uhmm, a method to make sure that people who don't think about ethics and moral issues every day that I can still kind of help them to take this into consideration when they're gonna install new sensors in public space or think of a new way to collect data on citizens and more even more balanced approach to this, to the right and and interest of their citizens.

EM [0:22:58.590]: It's it's very interesting. For example, during this development of the of the principles and all of these discussions with the different stakeholders, at some point the citizens who have become part of the discussion.?

Int 05 [0:23:12.750]: Yeah. So, so this were also part of the initial uh sessions to debate. Uh, uh, but I must say citizens, is also that I think this is a fringe topic, the only interested citizens who are open are already kind of invested in this.You know.Because and I think that's that's maybe also a good

thing because it's it's it's very difficult as a total a new person to come to this field and then have a fundamental goods idea about this.

EM [0:23:45.530]: Yeah, I think it would requires a certain learning curve on technology is and how information works, digitally.

Int 05 [0:23:52.990]: Yeah. And I, and of course I think also like if you really wanna be serious about having an inclusive digital city that the city should invest in this, you know, so there should be maybe at one point citizen panels discussing the ethical implication of the use of some kind of technology in the city, and that panel should consist of people who have no experience with the subject, but the city could release funds to guide these people and help them and invite experts to get these people up to speed and on their own level, to be able to form a formulated opinion about this. And in the end, it's only about values, you know, so it doesn't really matter. If it's about technology or waste or education or anything, people are affected by it and they should be able to have a voice about if they like it or not, how they're being affected about it. Or how to fix this city?

EM [0:24:46.10]: Yeah, I would agree with you, which is also kind of related to the yeah, to the main areas of of my current research. It's on how to. How to address and support the discussion of this of the values which oftentimes as you've mentioned, remains implicit.

Int 05 [0:25:6.890]: Yeah.

EM [0:25:7.10]: So how do we stop ignoring the elephant in the in the room?

Int 05 [0:25:12.780]: Yeah. No, no. So I figure it's not bad to to point with the finger to the, to the technology industry. You know, if you look at our devices in the way technology is being made these days, it's almost aade or not? Almost. It's it's made in a way that puts the the user really in a consumerist place. You know, you're not allowed to open your devices, you're not really allowed to look at the code, you're just, you're consuming the media and the technology that the other people think is good for you. And in the best place you can have is just be happy that it all works. So this is also a a position where a lot of people feel really disempowered towards formulating some kind of intelligent critique of technology because, yeah, I don't know, it's all hidden between a plate of black glass and shiny metal and I don't really know what's happening and we call big server farms that use a lot of energy. We call them in cloud. Yeah. So we have no idea what what they are. How can you don't have an informed debate about it.

EM [0:26:17.310]: Yeah, it does require a. Uh, quite an advanced level I'd say of technology understanding for the average citizen.

Int 05 [0:26:28.470]: Yeah, but I mean also the design and the language itself is already designed for obscurity, you know, not to allow this discussion to be taking place.

EM [0:26:38.610]: And besides the [redacted], uh, have you ever used or encounter another tool for having these discussions about values?

Int 05 [0:26:51.320]: Uh, yeah, I know that the [redacted] they made a really nice research project called.. name will pop in my head again later, but they they made like a really nice game which was like a a map of of a city, a fiction city, and then they made like little pawns that were symbols of different technologies like facial recognition cameras or smart lighting poles or smart trash bins, and then the people playing this they they went into the neighborhoods and like, and they really neighborhoods cafe, they would invite people to play this game with them and they had to place a different technologies on the map and say where they want to live and what this technology should mean for them and that they I really liked it how they made, [redacted] and they made a really nice, very low level way of engaging with people who have no experience with the subject at all. Like I I took part in one of their games and there were only people of like 70 years or older that just were always there in the neighborhood cafe and had no idea really about it. And they and they were really able to get these people in some kind of conversation with each other about technology, uh, that was kind of insightful and also really showed like how they what

they find this important, you know, is security important or is, I I really like to have one lady at one moment said Yeah, of course, security cameras are are nice I also feel unsafe, but I really just don't like it that that people don't talk to each other anymore in the street. You know, so it was kind of a way that other other issues that they had with the, with their neighborhoods popped up and they kind of pointed towards what they're figure are important and how they relate to the technology. So I've, yeah, I I don't know where the project is now, but I when I took part I felt like, OK, this is finally a way that I see how you can have people really tell what they think is important in a way that's informative and that's about technology.

EM [0:29:10.710]: Yeah. And actually I think like with the example that you just gave, it also shows the implications of the urban planning.

Int 05 [0:29:19.70]: Mm-hmm.

EM [0:29:19.860]: And that maybe there were some issues that now we're trying to solve with with technology.

Int 05 [0:29:25.520]: Yeah, yeah. Yeah, it was. Uh, exactly, there was the idea to put, like, a a smart lighting pole in the square, so that people, with Wi-Fi inside it so that people could also use the Wi-Fi hotspot there. And there was one woman who said Why do we put Wi-Fi then? People are gonna sit there watching their smartphone talking to other people on the other side of the world, why don't we just make a nice bench and invite them so the people sit there and talk to each other, you know? And it was like, really. So I felt like, OK, you're super capable of understanding the implications of this technology and just turning it up side down and asking for something that you really think is important.

EM [0:29:25.520]: Yeah, I think it's just. It's really interesting to have a well. I really important to have these kind of conversations.

Int 05 [0:30:8.110]: Yeah.

EM [0:30:9.760]: UM. Well, I like surely think we have a touch on all the points that I have planned for today.

Int 05 [0:30:17.950]: OK.

EM [0:30:19.130]: Is there anything else that you would like to to share? Regarding this topic…

Int 05 [0:30:27.910]: No, not so much. But I it. I I really look forward to your conclusions and and your paper because I think it's a very difficult topic and that a lot of people still have to learn. So also I hope to learn from well, the other people that you interviewed, I would be curious to to hear what other people have to say on the subject. Umm. Yeah. And if other new questions pop into your mind that you still have then you're welcome to send me an e-mail and we can talk more if that is needed, but.

EM [0:30:59.700]: OK, that will be perfect. Thank you.

Int 05 [0:31:1.790]: Just just let me know. But yeah, no other than that, good luck with finishing your research and all your interviews and make sure that you get enough sleep.

EM [0:31:11.690]: Yes. Uh, I any questions that you have directly for me? Everything is clear?

EM [0:0:6.170]:
Umm well, first to start the the interview, could you give a brief introduction of yourself?

Int06 [0:0:12.900]: Sure, no problem. I work at the [redacted]. I have like 3 different roles I I am there a teacher, Uh, I am a researcher and I work as a techno philosopher, which means that I've tried to get [redacted] as a whole, so all students, teachers, the surrounding work field on a higher level when thinking about the impact of technology. And as a teacher, I do. I don't do really. I don't have my own classes. I do a lot of guest lectures. I do a lot of thinking and and help students do challenges on the subject of the impact of technology. And as a researcher, I mainly do the [redacted]. So I've developed the [redacted] and it's just a new, it's brand new and now we're trying to.Well, get as many people as possible to [redacted] it. And we started with smart cities. Well, smart. Then we'll really smart, right? Just connected. Yeah. And but we also tried to get the [redacted] in other kinds of branches, like health or education or corporate. So. So that's what I'm doing. And I also write books and do all kinds of other stuff on the subject, but mainly that's it.

EM [0:1:43.550]: No, sounds very, very interesting and reflective kind of work.

Int06 [0:1:48.840]: Yeah, that's it. It's true. It's it's fun, and it's important, right?

EM [0:1:53.80]: Yes, I would say very important.

Int06 [0:1:53.690]: Yes, very

EM [0:1:57.50]: And for example, if we talk about the [redacted] could you maybe describe or share how this project came to be?

Int06 [0:2:5.940]:Yeah, it's, uh it. It was originally a project of the lectorate. Uh, of [redacted] and [redacted], which is a another lectorate, the two lectorates and the especially the second lectorate, [redacted], they noticed that it's really pretty hard to organize the right kind of discussion between all the responsible people surrounding moral design questions with the use of technology in cities. So it's about civilians, about people living in the city. But it's also about the people that are responsible the the public policy, the, the, the, the service, the public servants, the people like from the [redacted], and how do you connect all those people to have a discussion that is a lot broader than only a privacy issue or some little thing that's going wrong or or whatever and which is really more based on a different kind of values? And how can you structure. And then see how all these processes go. And often when you have these discussions that then there's mostly a real problem happening. So there is a like a data center somewhere, a plan in a city or city is planning to do something with drones that deliver packages or using cameras with sound or facial recognition or whatever. And then it it really becomes already a difficult kind of discussion. And the idea was to have the discussion more in a a [redacted] surrounding, in a safe surrounding, in a play, playful surrounding, just to practice with it, but also to experience how it is to have a different world so you can be a student having the role of the mayor of the city or you can be a entrepreneur having the role of a public servant and by trying to play this role you also get more understanding of the point of view of the other party. So so that was the the grand idea. So we should have like a [redacted]. So because that's always really also very hip and happening and have a [redacted]. Of course everybody have a [redacted], we do something physical, not the not digital, just people around the table and well, so so we try to find the right scientific kind of basis with the values and so on to design it, but also really try to make it again. So it's not something that you just and helps you have a better conversation, but it's also something you can win or lose should be something fun. So there was a lot of. Uh, yeah. Trying and iterations and again trying a lot of things with those, you know, you know those those little yellow papers you, you post-it memos, again or no, did they should be totally different or people don't understand this or this value should be renamed and all and all known. So a lot of demoing and testing and finally [redacted], just before the [redacted] we we designed a totally new [redacted] based on all that information. And [redacted] ago it was printed. And now we are the the now we playing it real life. It's a different kind of a huge groups.

EM [0:5:30.490]: Yeah, that's very, very interesting.

Int06 [0:5:33.40]: Looks really beautiful now, but I guess only the we made 150 boxes, but I guess it's. Oh, this is only also only a version #1, so we will still find out. OK. And then what we did was, we make sure that the cases that are there, there's a little videos and little descriptions of the case that they are not connected to the board [redacted]. So you it's just with bit QR code, so we can change the cases all the time, so also a a city can choose or a sort of group of people can choose to play a different kind of case which really important for them at a certain moment. Or we can have one of our standard cases to be played, but we can change them all the time because technology changes all the time. So it's. Uh, we designed it that way, and it also gives the opportunity to play the [redacted] within a different context, like with education or health or whatever. So you could you could imagine that with education like educational technology, things like, should I have an AI student coach or should I do online proctoring questions like that? They are also perfect to play in a [redacted] like this. But then you have totally different roles that you have, like the student and the administrator and the people of the of the board and maybe the the information manager and the the parents and whatever. So. It's the way we did it.

EM [0:6:54.60]: No, very nice and doing this, uhmm session that you had to try out the [redacted]. Have you done it with only people from the university?

Int06 [0:7:4.70]: No, no, no, no, no. We we have like the city labs, the cities, those, those all the all those cities have something they call the city lab which is a place they they try to do new things, have experimental discussions with civilians. Why are you call them with people living in a city? I don't know if the… city… citizens. Yeah, they have these discussions with citizens can be all kinds of things, but they are not. Uh, yet ready, connected to some real policy. So it's more like a safe space and a lot of cities have those city labs and they really like a [redacted] [redacted] like this because in that phase they were still experimental and they were part of it. So we played a lot of versions of the [redacted] in the city labs and then we just moderated them and then we monitor monitor just OK how does this work? Do people first of all do people understand the values? Because then we thought, Oh no, they don't understand it at all. They interpreted the value totally wrong. They it's like the value, the public value dictionary. Schwartz is is like the scientific basis of the [redacted], but then OK, well, they have a total different view with this value or that value. So we have to well, create different words there or maybe make this little quotes like. OK, this is what to to make it really understandable for people what we may we mean by the value. And then we thought, OK, they they have limited imagination. So we need to give them all the playing board, all kinds of words they can use like OK, independence and words like that they can use to think about how does the technology influence those words and what do I think of that? So then [redacted] became better and then we we learned, OK, [redacted] is really a problem because they, because those people are too too way too powerful and they always win. And we have to change things, have to change things a little bit with money. And we have to change make different rounds. So now we have a like a basic kind of playing with three rounds and yeah. And we have to change the time and we have to change anything to get the right dynamics there. So. So we did a lot of testing there. And finally, we found a version which which we have now which we are pretty sure that if you play it, you understand it almost immediately. You can play it almost immediately. You can have a meaningful discussion and also you can try to win the [redacted] or lose the [redacted], which you can feel how it is student negotiate those those values with digital technology in the city.

EM [0:9:43.630]: And have some has been the the experience for the for the citizens play in the [redacted]?

Int06 [0:9:49.390]: Yeah. Well, we we evaluated them, we interviewed them after playing the [redacted] and this way we learned all kinds of things. And most of the time, all people like it. It's just a a fun [redacted] because you have a different role. That's always nice. You know, it's like a it's also based on the old ideas of the Middle Ages. You know, when people play different roles, sometimes to to have have a great debate. So it's like, uh, like carnival in the Netherlands, we have this carnival. Then there's four days a year then everyone can play a different role. And there was no major. And then, yeah, the, the, the mighty person can be different than all the way around. So people always like that. So people like to be the major of the city or entrepreneur or so because it makes them think out of box. And also they really liked uh, thinking about certain things they never thought about, and because everyone at the table, because you play with six to eight players is telling the the arguments

pro or con, some kind of digital technology based on those values. So you get also a lot of new insights like I give you just a simple example. Say let's talk about drones that can deliver packages and then you meet someone from a a little poor neighborhood in the that's that. That is saying. OK. But I'm. I'm living in like a a flat. Uh, you know, a building with the and I I don't have. I don't. I don't have any place that a drone can deliver package to. So I don't want this and a lot of people live in flats like this, who like people that are older or need help that should be very benefit from a solution like like those those drones. And then you learn. Yeah, but they only. They only will work for people that already have a lot of money and and a garden in which the thing can land. And so “oh it's a new work”,new kind of a way of thinking. So every time you get new insights, which is also really valuable for for the city just to prepare for the discussion there.

EM [0:11:53.520]: Oh, that's very interesting.

Int06 [0:11:54.840]: Yeah. And what the [redacted] also does. It's something we added to it is OK when you play it, then you have to choose between, OK. I am really a PRO. This kind of digital technology or I'm against it. That's the first round and second round, you could then then negotiator start, you could say, OK, well, I maybe I won't be against anymore bearing these and these conditions and then you can write down the conditions that we have this little little write, you know, the writing on the pad there, is at the [redacted]. So you also at the end have this kind of impression about what people think is important and under which conditions they would be pro or against a certain certain the technology which is also valuable.

EM [0:12:43.240]: Yeah, I can imagine. And for example, since you have the the role of the major being a main part of the [redacted], have you or well, has any policymaker ever been involved in playing the [redacted]?

Int06 [0:12:56.990]: Sorry, I missed it. There was some hiccup in the sound.

EM [0:13:2.830]: Uh, OK.

Int06 [0:13:3.110]:Yeah. Well, I I don't think the major is in the [redacted]. I I I always say mayor, but it's the I'm I'm looking for the English word it's the. It's the responsible guy or girl under the mayor that's responsible for digital technology let. Let me let me see what.

EM [0:13:20.590]: Kind of like a secretary.

Int 06 [0:13:22.410]: Yeah. Well, let me see what the English word is, because it's a difficult Dutch public…One moment. Let's see Google Translate. It's the [redacted]. You know we have we have like a major and he has four or five [redacted] in a bigger… and then there are the. Then there are just the people from [redacted], they have this… a point of interest, like digital technology or public spaces or real estate, whatever. So the [redacted] has the money and he has the he makes the policy and he is the the most important player in the [redacted]. Because he often wants something he wants to create a better city with the this digital technology, and then all the other people they have this kind of a different opinion about that, yeah. So it's really fun for a uh, just a civilian to be an alderman.

EM [0:14:15.830]: Yeah, I can imagine.

Int06 [0:14:17.920]: But also the other men will see if you he has a lot of… yes. So some power in the [redacted]. It's. Yeah, he has utils we give him utils which is a kind of power but at the end yes we make like a coalition or find different people to help him get his idea uhmm realized.

EM [0:14:38.660]: Uh, interesting. And has any policymakers? Maybe. Not necessarily someone with the position of of the [redacted], but have they been involved in in playing the [redacted]?

Int06 [0:14:48.560]: Yes, sure. Yeah. During the [redacted] there were some [redacted] and some people from the [redacted] and some [redacted] and some [redacted]. So we have all the people that have played in the [redacted] that the roles have also already a lot of times [redacted] So and of

course. Yeah. Well, just depending on the table. So sometimes we play the [redacted] with with [redacted] like with 40 people and they just have to be introduced in the world of digital technology and the the moral design, strategies there, any questions or whatever and then they just play and you have only people from the [redacted], but sometimes you have totally mixed groups. We don't really care. We just say, OK. We don't. It's up to you as a, as a city or as a group of people and talk to us how you want to play the [redacted] with which people and which which, which goals. So what he do do? But one of our ambitions, but it's for later is we design the board in a way that we ask the players because people will play with, with our moderation and without. We ask people to make a after every round, the picture of the board, because the board gives you a great impression from the from a how you think about digital technology. So you play round Number one. At let's still have the example of the the package delivering drones. You play around #1 and then you ask all eight players all eight roles, to have these little characters and say, OK, I'm against this because of this or I'm pro because of this. And then you can play 3 little characters, you know, wooden, those wooden kind of things and then. After the round, you can make a picture and they have great impression. OK, this is the first initial way people think about this digital technologies and then at round 2 you start to negotiate, OK, can I why are you doing this? Can I get you to from pro to against or on the vertical editions? And after round 2 you make a picture again and after round 3 you you play with Utils with power and then you try to find the coalition, convince all the people with your power and then you make a picture again. And because we designed the board in a way that they can read this because we have a certain markers, we have the ambition in the future to also show you and and do some research there. So how how does this change? So you could you could say OK this was round one round two the end positions totally different. So negotiations were really successful. If it's exactly the same then or almost the same then it goes occasions weren't as successful as you think and then round three you get to utils and you can see again how everything changes so if you play the same case on a lot of different places you can see the differences between the cities or between the players that are on the table, and you can see the see it move around. You can even make animation if you want in the future. But you don't know yet. But that's just we designed the board to be able to do that.

EM [0:17:53.420]: No, it sounds very very interesting and very and I I think it opens the the door to a lot of possibilities to have this kind of discussions which I think are are quite important.

Int06 [0:18:8.730]: Yeah. And it's also, I guess because you you, you shouldn't be because a lot of cities talk to us and then they say, OK, can we use this to make decisions as and don't do that because you're playing roles, you really have to do it to, to, to train or to practice having the discussion and to get all kinds of insights and how people think about this kind of technology in a city from from all these public values. And then this helps you to better be better prepared to have a real discussion with your citizens or whatever, to get some policy across, but don't use [redacted] for that, because it would be really, really strange and and it's also just a great way to get people introduced to the importance of thinking about the technology in the city from from a moral perspective, uhmm, from all kinds of different kinds of views with different values, different roles, because otherwise always the discussion is really limited. It's also that thing I don't like. That's it. Let's focus there.

EM [0:19:17.70]: And for example, with this kind of conflicting values between the roles. Umm, does it ever happen that within the [redacted] it's the person it's bringing their own values?

Int 06 [0:19:29.140]: Yeah. Yeah, sure. It's it happens all time because we give you the opportunity to call on your role. So for example, you are like an an alderman or entrepreneur. And at the beginning you introduce yourself and you could say, OK, I I I'm. I'm like an entrepreneur of digital company and I really like digital technology. And then you have a totally different kind of role-playing. Then if you are like an entrepreneur of a company that is doing something with agriculture and don't like digital at all or whatever. So that's that's up to you. It's also we have members of the [redacted]. It's totally different if you from like more right wing or more left wing or more progressive of conservative. That's up to you. So you can call your own role, which should you you should do based on who you are as a person, and then you start playing because of course, otherwise it is really strange. So you are really progressive member of the [redacted] and then you you are really conservative inside and then you get a real. So the the, the, the people that are all the table, they really will totally change the way the [redacted] is played. And I think that's a good thing because this helps you look at it from all kinds of

perspectives, especially if you play one case at 6 tables for example. Because if you don't have all the conditions on which people will say, OK, that's OK or not, and if you make those pictures and if you end it, then at the end of the of a session like that, you have a pretty nice insights in how people are thinking about a certain digital technology.

EM [0:21:2.340]: Yeah. And how is the [redacted] addressing these conflicting values? Is there something within the [redacted] play that makes them have the discussion?

Int06 [0:21:11.50]: Yeah. Yeah. Because what you do is first you can just give your values and place the little wooden characters on the boards. So then these are my values. This is what I think about this digital technology and those values they they are from Schwartz, you know Swartz.

EM [0:21:28.940]: Uh, yeah, I think it's, uh, like 11-12 values, 14 maybe. Yeah.

Int06 [0:21:34.220]: Yeah. You have some like conservative values or, you know, values are very progressive and things are like, OK, I'm really into power or success or safety or equality or no values like this. So you just place your characters, per value you could say a pro or against. So for example with those kind of packaging delivery drones, you could there's a value that's called safety, you could say, well, I'm really against those phones because I think they are really, really unsafe. Because they can land on your head or whatever, or because they will invade your privacy, or you. Or you could say no, I'm really pro those drones because they are way more safe than those little buses, those little white buses that are driving around the city all the time.

EM [0:22:24.730]: Yeah.

Int06 [0:22:25.410]: So you can just explain these things so you can you you can say OK within the same value you can be pro or against and and then you then you have to play your three… but some values are conflicting because some people like that things remain the same other people like change but still in in the value also you can just show you can place this pretty nuanced so you can play those play those characters and then of course you can start to negotiate that's round two and then you will just say OK I'm this kind of guy I'm pro those delivering drones. I see this older player, which is against it, let's ask him. Let's have just have to conversation. But why are you against? Are you sure? You really think about it? Under which condition would you be be willing to move your character to a pro? Or maybe I'm pro under conditions in which conditions are those? And then people. And then you have. You need to have respectful discussion, of course. But that's also something you can practice. So some people will say, OK, no, no, I won't move it, that's OK. But uh, yeah, well, now I hear this. So OK, I'm really. I really don't care about... I'm really worried about privacy... OK, but if you make this kind of agreement, a condition in which we would say there was an audit and every year that whatever and would you be willing able to go then? OK. I'm pro. And the conditions, whatever. So you can play a little bit around this and you take some time for that. And at a certain point you will say, OK, those little little carriers will not move anymore. But because people say OK, now now this is it and then power comes into play. That's the final round and then you can just resolve conflicting values because some people have more power in discussion and other people. And you also feel how it is to have no power at all. So like if you are a student in a city and you're really against those delivering drones then it's still hard if you have an entrepreneur with 4000 utils or the alderman with 6000 utils, which is really a pro. Because they will win and it was. And then you will see how this happens and then you will feel something like maybe I should be more... Yeah, that's something to feel. So that's just the way the [redacted] goes. Any OK? It's winning or losing. But at the end, everybody wins. Of course, because you get a lot of a nice debate, a lot of fun and insights in all the arguments surrounding these kinds of moral design issues.

EM [0:24:53.450]: And for example. How are the players dealing with having to confront these, uh conflicting values like having these maybe awkward discussions or that maybe they don't wanna have in their day-to-day lives.

Int06 [0:25:15.70]: Well, normally because they play roles it's not really a problem.

EM [0:25:21.10]: Interesting.

Int06 [0:25:21.120]: So players, don't, they they it's just a role you're playing so you can hide behind it, that helps. So you don't have to, uh, put all your personal cards on the table, and if you play it right, it doesn't become personal. So if someone is, it's like if you play like, I don't know if you play like a board [redacted], just like whatever, like monopoly, you also don't take it personal. If someone is hitting you a lot of money here because you landed on there on the on some kind of street that he owns, so that that should be the same with the with the with the [redacted]. Because otherwise it's. But again, that we we get at the point and it's like a serious discussion about how we going to do this or not, and you shouldn't do it in this [redacted] because it's a safe environment. So we also make it very clear, OK, well, we just stacked the cards and then they hand them out blind. So everybody gets a role, which is something they should play and it makes a lot. It makes it more safe and it makes it less awkward. So you don't get people getting into an heated argument at the table or whatever. And I also think if you go there to play that [redacted], you're that's one of the big problems we have, of course that it's still something that people are interested into these kind of discussions, they can get involved there. But if you are totally not interested but well, but you are subject of those digital technologies or whatever, then how to get those people to play? It's still I think a hard question because of course it's about values and it's people with higher education will be more inclined to play the [redacted] that people with lower education, which all they are just less interested or they don't have the time for it. So that's but that's I think a way broader problem that is in play with in getting citizens involved in your in your decision making.

EM [0:27:22.10]: Yeah, I would agree. And for example, are you were talking about resolving these conflicts during this stage. Three of the [redacted]. How does this happen? Or I mean maybe it's part of the [redacted]? Like what? They resolution?

Int06 [0:27:36.590]: No, that the yeah, there were two rounds and at round 2 you try to resolve the conflicts by negotiating and that's based on on arguments. It's just negotiating with arguments. It's just trying to.

EM [0:27:50.90]: But it's negotiate negotiation to move uh positions.

Int06 [0:27:54.160]: Yeah, yeah, you get you OK. You are against this. But again, I convince you with my arguments to go to pro or maybe go to. OK. I am pro under conditions in which conditions are they? And you write down the conditions because that's valuable information. So that's round. #2 get people to move based on arguments. So you doing just doing that you just picking on someone else at the table. OK yeah. What do you think would you now? In round three, you pick two persons. The one person that was most vocal in the pro part of digital technology, and one person that was most vocal in the against part of digital technology. And you ask those people to get the other players to donate their money, their utils, we call them utils in the [redacted], to your case. And they don't. They don't have to donate all they have, but they can do. They can say, OK, well, I don't want to have a part in this. I don't pay you or I want to give you all my money because I think it's really important or I just want to give you part of my money. And then the the the player that gets the most can be pro or against, he wins the [redacted]. Because he can remove all the other characters from the table and just only have his characters there and then it feel, then you get a feeling. OK, so this is the way it goes at the end. So this is the way it works. So this is the way it's played and the final round is especially there for people to feel how it is to also play on a very unequal playing field because that's reality, of course. Yeah. So that's a… we we tried to convince people to play a round 2 as if there was no round 3. And if you were really successful round two, then you don't need ar ound 3, right?

EM [0:29:48.500]: Yeah.

Int06 [0:29:49.0]: Yeah, but that's a. Well, that's something to, we, we we still have to find out if that. That's why I was telling when the beginning we have now 150 boxes but it's the only version 1 and maybe we will learn doing [redacted]. OK, maybe it should be a little bit different a little bit all the way around but but but for now the the big the big issue is that at the end everybody had fun and had some new insights and I was playing with you. Just say, well, it's as we we we notice it's really important to to be able to win or lose of course. Otherwise why call it a [redacted]. Yeah, you should call it like a a a tool for debate or something, but that's not it. It's a [redacted]. So well.

EM [0:30:32.310]: No, it's very, very interesting. For example, in this around the , well, it's call it proposals that have the most vocal people on each position. Did they form those arguments or they informed by the second round?

Int06 [0:30:51.650]: No. Yeah, well, in the second round, everybody can try to convince someone else. It's just more like organic. It's just OK. Yeah. I have in the and then you will see people are more vocal than other people. Some people are really against. And some people are really pro. And then you are the moderator or just if you play without a moderator, you will find out yourself. You you already know. OK. From this eight players, this guy or this girl is most against that. This is most pro and let's ask them in round #3 to try to find a coalition with money and to get as much money as possible to really force the, force the issue. So that's the way it works. And it's sometimes it's. It's really, really easy because then you get like the the big players involved. OK, I have the entrepreneur and the Alderman and the people with the most money, and I have them in one group. And then I just push away all those poor people. But sometimes it's way more nuanced because then the entrepreneur will be against. And then there is like a it's really a. It's really, really a really close who's going to to win the [redacted] and it it is, it doesn't really matter. It's just happens. It's just a a way to try to find out how how this works and how this feels to lose it.

EM [0:32:11.370]: And during the development process of the [redacted], uh, how was it? Uh. Yeah. How did you come up to this structure of having these three phases?

Int06 [0:32:20.980]: Yeah, that's just that's just by uh, by, by playing a lot of [redacted], because first was just one was just like a one [redacted] and then you couldn't be. You have to to find out, you have to for example you have to you have these values from Schwartz and you have to speak a value and say OK, I'm against, I'm against this because of this value but you couldn't on the board you couldn't see if you are pro against or there were no conditions so it would be really fuzzy. Well, not, and people still liked it. Nice conversations because you know, if they don't have to work and they can just sit in a room and there's coffee or there is like a drinks afterwards, that they are still still nice. But it was really fuzzy and unstructured. So every time we thought, OK, no, it's we should do this differently. It should do this differently. So it's just like iteration process in which two things are really important. One is there should be a great kind of debate and like there should be all kinds of new insights for people to be gained and two it should really feel like it gained it can win or lose. And so it's it's just like testing and demoing and all the time again and testing and demoing and improving step by step, improving the [redacted]. So that's that's the way it worked and we we didn't want to do any concessions on the on the scientific basis of Schwartz, but because we also thought, OK, maybe if we have different values, things would be really easier because some some people don't really understand those values, that should be more connected to you know some some cities, they have their own value board. But the we tried. OK, now we don't want to do that because this is a pretty important scientific basis that we have there and we just try to make the board more understandable for everyone by having this little quote, you know, like it conservatives, I I just want things to remain the same or I really excited about change. So there's little quotes that people really feel instead of seeing all those complex words. So we also try to make those words as easy as possible. So this is a this is a, this is too complicated the words it should be more easy. And this way we could be, we were able to remain the scientific basis but still make it feel like just just the [redacted]. [redacted]

EM [0:34:51.150]: Very interesting. I I would think you would have to make them less abstract for everyone to understand and it just a few seconds.

Int06 [0:34:58.890]: Yeah, that's true. Yeah. And still sometimes it's a it's hard for people because then they OK, which value should this and that but that that's why the best way the [redacted] is played we think is with motivation. Because I you also sometimes, we also see that plays become really fanatic and then they make it personal. Then they say things like OK, well, I'm the alderman. And if you if you vote for for my idea of delivering pictures with roads, you can I I will sponsor your Tennis Club. But then we say no, no, you can't do that. You should. You should only use arguments that are really connected to the to the moral design issue. Don't try to do other things, because that's not the way it works. So and on the other end. Also nice of course, because it means that people really try to win it and value it. But with good motivation you can get something. " OK. No, no, just stay on topic. Be respectful, use only arguments that are connected to the topic" and something that's, I think really

important is we also learned in the beginning we had more like fuzzy cases and then we made them really, really strict. OK, this this is the case. So you can also find them online. But the case like we have delivery drones. This is the privacy issue there. This is the way they handle privacy. This is the way they fly. This is the place they fly. This is the conditions under which they fly. This is the case. Play with it. What do I actually get all these discussions about? What is the delivery drone? How do they handle privacy? How do they fly? Do they fly above the roads? You know, or do they also fly? Uh, like in the park or you get all the discussions and the all the. We we knew all these kinds of discussions and all the way they went themselves. No, we bring it back to. This is the case. You have to play within the boundaries of this case because we want you to think about the values connecting to the case and not about the technology of the case itself. Because then, OK, then we have the discussion about. Yeah, but what kind of? So we also have this case for the data Center for example and then we say things like they city wants to build a data center and it's it's it's green, it's sustainable. It looks like this. It's only people that and we have some really strict rules there and then you can play the the question, OK, should we do this? Should shouldn't we do this and which which values are there which is totally different than if you just say, OK, there's a data set coming into city then people say OK this is from Google? or Facebook? Is it sustainable? Is it yeah. No those questions would be answered beforehand because then you can play. And if you don't answer them beforehand, which we didn't do in the beginning, then, well, then so then then that's not clear then. So they could first discussion at the table.

EM [0:37:50.600]: Hmm, I imagine that discussion goes in a completely different route that what you want.

Int06 [0:37:55.490]: Yes, yes. And then then also if you make the you know the pictures of the situations, any conditions, you don't really know anymore do what kind of moral issue it's connected because you don't know what they played with.

0:38:32.640 --> 0:38:32.980
EM []: True.

Int06 [0:38:11.90]: Did they play with the, you know, Amazon getting getting there with the data center or they they play with some kind of data center that's meant for city services, which is really sustainable and only only the services that are for citizens will be hosted there or what do they do? We don't know. So we made that, we made it very clear. They are short those cases really short, but we, a good motivation is OK you can only play within the boundaries of this case otherwise it won't work.

EM [0:38:42.720]: OK. And could you maybe talk a little bit more about the moderator role within the [redacted]?

Int06 [0:38:49.440]: Yeah, what we do is we, we we also offer different kinds of services to to cities. So we say, OK, we can do a few things, we can just organize an afternoon surrounding the [redacted]. Then first we give the presentation about the importance of moral design and stuff like that and then we will play with you and we will provide the motivations. Because then, like you, play at 8 tables and we have eight moderate moderators for you, and they will make sure that you stay within the boundaries of the [redacted] and it will help you. It's just like, you know, if you play a board [redacted] and you, you read the book for the rules, you like the you like it five people, four people playing a board [redacted] and none of you ever played it, it's pretty hard, right?

EM [0:39:32.30]: Yeah.

Int06 [0:39:32.860]: Even if the rules are totally clear and pretty easy, it's still hard to play the [redacted]. But if there's one person who played the [redacted] before, then it becomes really easy.

EM [0:39:43.290]: Yeah, for sure.

Int06 [0:39:43.910]: Yeah, that's always. So that's exactly the same with motivation. If there's one person who already played it, he, he or she can just sit at the table and help you get started really,

really quickly and just make some corrections if it goes in the wrong direction. If it's something people are thinking, OK, should I do play three or two characters and they they just know. So that's easy. That's reason number one. But you could. So we could just provide you with motivation. And we really say, OK, this is a really good idea because then [redacted] is better, but it could also do and also do sometimes if we just say OK, we go to your [redacted], we come to your office or you city and we and we just play with eight people. And what we play like an intense session. So we train those people to become moderators for the future and then the city can start playing that [redacted] everywhere, anywhere with the with the, with those strange people because well, training is a big word. You know. It's like learning to play Monopoly which don't have to be trained. You just have to play it one time and have some extra information about yhings that can go awry or wrong and how to do how to solve them and that's it. And then you can just play it with other people again. So that's a, which we think, yeah, well, it's it's we may it's especially with this [redacted] it's it is important to have motivation because it makes sure that everybody stays on topic.

EM [0:41:9.700]: And what would be some examples of things that could go awry during the during the [redacted]?

Int06 [0:41:15.430]: No. Well, but you could you discussions could be not respectful discussions could be not not on topic like OK people could be too fanatic. Arguments could be not connected to the case. Things like that. But but, but often it's more like a practical questions like, OK, how long does the round take? When do we quit playing? How do we? The for example you have 3 characters which you can play with pro or against for the values, but do you have to play all three or can you play one in the later rounds? Because that's real life. Sometimes you think OK, now I've played two characters because I didn't have anymore values of arguments. But now I've heard all the discussions later. So in the negotiation round you can still play again another character again, because then you think I heard all these things. Now I'm still against or pro or whatever it changed. So can you do that? And then if there's a moderator, it becomes really way more easy because they know. Yeah, you can do that. You can do that. So that's that works and how well our experience is most of the time, people are really nice. So you could also prove provoke them to be a little bit more, uhmm, in their role? Don't be too nice. Uh, you're you're just a role. You can be. You can play a little bit more fanatic, so that's the other way around. So it works both ways. So I think the role of the modulator is. Especially just to get the the [redacted] played as intensely as possible without becoming not respectful.

EM [0:42:58.630]: OK, it's my it's clear now.

Int 06 [0:42:58.980]: I I've never. It never happened. Never happens. But I could imagine that people would say. OK. Because I think for example in the [redacted] there is this role, which is someone that is really into privacy is it's like a privacy advocate. It's there, and if this person is of course really strict about all those privacy things, and if this person doesn't want to move, you shouldn't be. You should be respectful of his position instead of getting really angry with this guy or girl. So that's so you could imagine. OK, well, I said I showed you this and this and this and this and I still you don't want to move. Yeah, well, that's the way it goes, yeah.

EM [0:43:39.450]: Yeah, that's how easy in in real life sometimes.

Int06 [0:43:41.720]: Yeah, that's sometimes they move, sometimes they don't. I don't know, but don't get angry with them because it's just a [redacted]. It's the same with monopoly and you don't get angry. It's just a [redacted]. It's fun, it's family. I don't know. So that's the idea. That's why we think that that role is pretty, pretty important. But you, but there are a lot of people who just order the [redacted] and play without it. That's also OK.

EM [0:44:7.560]: Umm well, I think this would be like the I think we have covered all of my questions. I don't know if you have anything else that you want to to share.

Int06 [0:44:15.580]: No. Well, maybe it's fun, but there were two things you can well, maybe if you want to know more about it and if it's like a few months, if we played a lot, if it's still relevant for you, don't hesitate to to contact and if maybe and well, the [redacted] is still in Dutch.

EM [0:44:35.290]: Yeah.

Int06 [0:44:37.140]: So I don't know exactly why, but we created in Dutch because it's. It's meant, of course, for citizens and and, you know, English is like a, well it's it's less inclusive in English. It sounds a little bit of a paradox, but people really think it's a lot of people in a city think it's hard if it's not in the Dutch, so, but maybe in the future there will be like an English version also because a lot of I got a lot of questions already about it, OK, why isn't there an English version? So maybe you make it the next iteration. And for now, it's just a A in touch. But maybe if the relevant view of if you played it like a like a few months, you have some new insights also about the. Yeah, like the the research we can do with it or how people are affected by it, we can do some information stuff like and if it's still relevant for you, don't have that contact me because we well, it's just open. So we share, yeah, we can share everything.

EM [0:45:33.890]: OK. Yeah, that would be that would be great.

Int06 [0:45:36.520]: OK.

EM [0:45:38.320]: Any other questions that you have for me?

Int06 [0:45:42.440]: No, OK, I wish you luck with your. What have you are doing and no. That's it, I think.

EM [0:0:5.920]: Well, to begin this interview, could you give me a brief introduction of your of your, of yourself and your expertise?

Int 07 [0:0:15.150]: Alright, so I'm [redacted] at the [redacted], working in a a consortium project about smart cities, specifically focused at [redacted]. The project is called [redacted]. So what we do is also specifically focus on construct, making constructive use of controversies which we have defined as kind of multi stakeholder conflicts about values. And so really focusing more on the ethical part and the societal part of technology in the city. And I'm working in a team with 2 universities and five local partners, and my expertise is specifically on making this constructive use of controversies, combining thereby insights with design, research and ethics of technology.

EM [0:1:0.620]: OK. Sounds very interesting. And related to what I'm yeah researching into for my masters. Could you perhaps..

Int 07 [0:1:9.150]: Because what exactly? I'm sorry. What exactly are you researching?

EM [0:1:15.710]: Yeah. Well, the goal of my thesis is going to be to create a tangible toolkit that can help these multistakeholder collaborations have a discussion about values and that can help them in framing their project. So that's why I'm looking into.

Int 07 [0:1:37.880]: Yeah, it's nice to know, yes.

EM [0:1:39.780]: Umm. So from the uh project that you're part of, uh. Could you perhaps share how with this project came to be?

Int 07 [0:1:48.640]: Uh, so this project is in [redacted], so it came to be the out of a I think it was a [redacted] city, something like that call and it's collaboration between [redacted] and [redacted] in [redacted], uhmm, that kind of we're all willing to work on this element of smart cities specifically because [redacted] is a mid size city. Those are not as kind of well well known with smart cities you could say is the bigger cities as for example [redacted] they are the front runners, but there are way more mid-size cities in advance. So they wanted to be kind of an example city of how to use technology and responsible way in their city.

EM [0:2:29.790]: OK. And how does the collaboration between the different stakeholders work?

Int 07 [0:2:36.140]: Uhmm, the intention was that there would be a case provided by the [redacted], an actual case where they would be implementing technology in the city and that the [redacted] would do their independent but collaborative research on that and that the project partners would all be involved in separate strands of the research, either advising or contributing or reflecting. But because of the change of the [redacted], the eventual case got or the actual case eventually got suspended because they decided on a different type of smart city policy, so now it mostly to play at partner meetings and having internal discussions.

EM [0:3:15.840]: OK. And how does this process of reframing the project whenever you have to make a change, how does that happen?

Int 07 [0:3:25.330]: How do you mean?

EM [0:3:27.350]: For example, what you were mentioning that there was this change in the municipality, so they have to change the project. These restructuring, let's say like changing the scope, how does that happen? Is it just through the through the meetings?

Int 07 [0:3:42.340]: Yes, mostly. Yeah. Yeah. And in that sense, the the [redacted] were leading also with certain research goals to attend to. So they were leading, but it was always in agreement or in discussion with the partners, also continuously looking for other opportunities, other cases, other opportunities to collaborate in different types of projects. But the lead was mostly common from the [redacted] in that sense from the researchers.

EM [0:4:8.100]: And does it ever happened that there are conflicting views between the partners?

Int 07 [0:4:13.760]: Hmm, I wouldn't say conflicting views so much or we haven't experienced that in the project. I do think there is conflicting expectations. So on what they could contribute or would contribute on what the [redacted] would contribute, what type of insights would be rendered. And I think that's also a process of kind of learning by doing from all the partners. But I wouldn't say conflicting views. We haven't experienced that.

EM [0:4:38.350]: And then uh. What would be an example of these conflicting expectations and how do you address them?

Int 07 [0:4:47.630]: Well, I think the one of the conflicting expectations that in general the timelines of research or longer than the timelines of projects in the industrial sphere are kind of or in the [redacted] itself. Or for example, one of the partners, they organize events. They're like a a [redacted] almost for smart cities. They organize events really regularly. So they wanted way more fast results and kind of catchy results to share within their community. So I think that was a mismatch of expectations and and other than that, we just had a the final wrap up of the project and there was also a big expectation gap apparently in language as a [redacted] we work mostly in English, we also have non Dutch speaking colleagues working on a project. But the [redacted] in the general Smart city teams prefer to work in Dutch. So that turned out also to be a gap and mismatch. And we've addressed that by for example making several tools available in Dutch.

EM [0:5:52.280]: Oh, interesting. And during this uh, whole research process, how much are the citizens involved?

Int 07 [0:6:1.680]: Well, we for us, it was really a big focus to have citizens involved, we have tried that from the start by working with citizen groups because they were not a formal partner of the consortium project, and I would also think that's very interesting to look at future construction projects. If you can really directly involve a citizen group and that. So that because now for us the contact kind of was established through the [redacted] with the citizen groups. But I think it's interesting if you have them really as a separate consortium partner, uhm, so that's how we got the citizens through certain representative groups. There's a citizen council in the municipality so we tried that route. However, it did prove a bit difficult to have them as real partners for the project and in other ways where we involve citizens is because of the tools we make there are exhibitions and several places. So [redacted] or a library, et cetera, and that's where citizens interact with the tools.

EM [0:6:55.950]: Then what kind of tools have you developed or used with the citizens?

Int 07 [0:7:1.860]: There were a couple that were used at [redacted]. So for example, we had a a card game, a futuring card game at the [redacted]. There was the first time we were there where citizens got to pick three cards. Sorry, four cards and had to write a story about the future of the city connecting allocation, a technology, a certain societal trend and ethical value, or a societal value to kind of to really make that connection between values and technologies and city life. And they all wrote down stories and we collected, I think something like 130 histories said it was really nice. And the last time at [redacted], for example, now the tool uses future fictions, which is an interactive game that participant, citizens or other stakeholders can play to become immersed in a future city scenario and become acquainted with different types of speculative technologies. Neighbors perspective on that, and have to make their own decisions regarding the evolution of the city and the implementation of technology and in that sense they also become more acquaintant with what a smart city could be, what impact it could have and kind of what they would find desirable for their city.

EM [0:8:9.320]: Very interesting. How did it go with the? I mean, how was the experience for the people using these tools?

Int 07 [0:8:17.200]: Yeah, very interesting. So we tested it also with students and it was at the [redacted] and at [redacted] at several locations. And it's very interesting that also, for example, with students, they're also they are very interested and intrigued and wanting to discuss the presented kind

of dilemmas in the future frictions environment. We also notice that at the library, for example, it was a less guided experience and people are more confused by the experience itself. So in that sense, we also learned a little bit about how to present and provide such a tool.

EM [0:8:52.480]: Interesting. So these are the tools that you've developed and applied to deal with these controversies.

Int 07 [0:9:1.900]: Uhumm.

EM [0:9:3.140]: Oh, that's very interesting. And for example within the. Uh. Within the project that you're part that your [redacted] is part of. Umm, how is it managed the different uh interest of the different stakeholders?

Int 07 [0:9:24.580]: And so, again, we have these consortium meetings where we come together with the different stakeholders where we discussed kind of steps of the project and also everybody's goals in it through newsletters with each other's updated and individual meetings. I think that's also a core step. But with individual meetings with all the partners kind of to exchange thoughts, ideas and expectations.

EM [0:9:49.810]: Interesting. And for example in your in your project like what is the final outcome of the [redacted] research?

Int 07 [0:10:3.180]: That's to be seen. I'm writing the writing the thesis. So for me there's the, the core outcome is that I've created two tools based on systemic design and one based on speculative design to kind of make use of this constructive potential of controversies. So maybe zooming out a little bit, actually the core outcome, which is part of also the core vision of this project is that we can really make constructive views of conflict. So rather than avoiding conflict and kind of trying to smooth it out, we look into, OK, how can we use actually what's brought to the surface by this conflict? What does it say? What, how can we bring people together? Through it, how can we make better decisions through it? How can we reflect better on what's happening through controversies? And and then with that vision in mind, the also the idea of using design research for that or applying design research to that to making things more tangible rather, movement from the kind of discursive sphere to the more tangible, creative actionable sphere. Yeah, that's core in my thesis.

EM [0:11:4.970]: Sounds like a very interesting result.

Int 07 [0:11:9.640]: Thanks.

EM [0:11:12.540]: Well, now that I've shared with you what my thesis is going to part, and also we'll embracing these controversies and these conflicting values between the stakeholders and from your research, is there anything that you seem valuable for me to to know?

Int 07 [0:11:31.160]: Maybe to answer that like more meaningfully, can you elaborate a bit more on what setting your research is taking place or do you have specific stakeholders or is it a specific case as well or?

EM [0:11:41.330]: Yeah, sorry I forgot to clarify that because it's also in smart cities. So I've been talking with practitioners, researchers. I think one of them is also working with a municipality. And how they are addressing all of, yeah, how they are addressing or just ignoring the controversies during the projects. So that's what I've been looking into like how is everyone dealing with this or? Yeah. And for some, it's just ignoring them, which I find really interesting.

EM [0:12:17.460]: Now, what type of practitioners have you talked to? Uh, I've talked with researchers from the [redacted], one from [redacted], one researcher he did a game to discuss values. I've also talked with [redacted].

Int 07 [0:12:46.60]: Yeah. Yep. But it's mostly researchers then.

EM [0:12:49.280]: Yeah. Yeah, so I'm learning how it actually happens in their day-to-day life because they are the experts, they are, they are working on the field. So I'm just trying to figure out how from every once expertise, how this discussion of controversy is can be supported at its best.

Int 07 [0:13:13.990]: I think what we'll… because your question is then any like tips for your research, right? Or what was your question again?

EM [0:13:21.790]: You. Well, yeah, it can be tips. Like uh. I mean, you are the expert, so any in the input for me to very valuable.

Int 07 [0:13:31.220]: I think it will be very interesting to talk to the practitioners in that sense. So the people working on Smart city projects in the municipality or the people building the technology, because from the research perspective it's a different perspective. It's less with the feet in the clay, as we say in Dutch, I don't know that really translates to an English word, but I think that would be an interesting case because from a theoretical perspective, conflicts and controversies are really meaningful, from a practical perspective I think they are as well, but people tend to avoid them or ignore them and for good reasons as well, right? I mean, you have internal politics, internal relations, you wanna keep it on a good footing with people. You wanna focus on a positive not on the negative, right, I mean there's ample reason also to avoid conflict, right? Just as there's ample reason to embrace it. So I think it would be really interesting to better understand why are people avoiding it, and how can that be balanced by, like, also people who know what the potential is why are you still avoiding it and how can that be balanced in a sense, by indeed making the potential of conflict better available or bringing in different tools? Or is it mostly about the timing when there's these conflicts and controversies happen, et cetera. I think having more insight on that from a practitioner perspective would be very valuable.

EM [0:14:48.770]: Umm yeah, I think, uh, some of my interviews have touched on those topics, I find it quite interesting that one of the interviews that I had uh, this researcher was like, yeah, I know there's this controversy and we just ignore it as long as we can. So I find it quite quite interesting that that was her approach, even if it was a very very participatory approach to the to the work she's doing. But then, yeah, apparently her way of working was just to ignore these controversies for as long as it was possible.

Int 07 [0:15:33.150]: And did she give any reason for that?

EM [0:15:36.310]: Uhm. I would say that the reason she gave for that uh was that in her experience. It usually goes away. Eventually it's not a a controversy anymore. But yeah, it was one of, an interview that was, like really hard to to get this specific so of her work and what she's doing. So yeah. It did feel like a delicate subject to my almost. Yeah.

Int 07 [0:16:15.20]: And I think that's core as well, controversies are very delicate, right? So if you're not talking about them from a hypothetical or from a research perspective, but from a lived perspective, they are very. Yeah, they're, they're difficult to talk about, right. So that's why I think a practitioner's perspective and practitioners experience is really valuable on that, so not the research perspective, but really the people working in the [redacted] working through these conflicts or ignoring these conflicts kind of experiencing them because for them it's a more delicate manner than as a researcher kind of viewing it. Yeah, we're observing it. Of course, as a researcher, I'm also involved in it, right? But I think it's a very different experience than being in the municipality dealing with the different type of stakes, et cetera, from a day-to-day basis, yeah.

EM [0:17:3.180]: Yeah, I would agree. And uh, going back to what you mentioned and how you're using service design to create your tools, could you elaborate a little bit more on that?

Int 07 [0:17:16.830]: I'm not using service design specifically.

EM [0:17:18.570]: Oh, sorry, uh, systemic design. Sorry.

Int 07 [0:17:21.110]: Yeah. So we're using systemic design because we see controversies is kind of leveled elements, so they contain multiple value tensions that exist at different levels between the at the individual level, between individuals, between organizations, or at the societal level, and to address all these levels, and also to fully kind of embrace the complexity that's in controversies, we use systemic design, because systemic design provides a very meaningful approach to indeed navigate complexity in the sense by understanding the systems perspectives. The broader perspective, but connecting that kind of to the individual human center to perspective, and we do that, for example, through a workshop where we map out the network of conflicts that we say kind of is the anatomy of a controversy. So by making that visible in a map, we also make the controversy more manageable and understandable. And the different kind of shades that the controversy has and the different type of perspectives that come together. Or perhaps it align in it by making that visible by mapping that out. And we use systemic design as a way to make a controversy more approachable.

EM [0:18:29.550]: And how do you map it? Like is it digital or physical?

¡Int 07 [0:18:35.370]: But it was mostly digital because of Corona. But there's also a physical way to do it, I think, because you're part of [redacted], right? So I did it with your fellow students in June earlier this year in a workshop setting, uh, So what happens is that we use a scenario and role play exercise. And because you were in there, right?

EM [0:18:56.460]: Uh, no, it was. I was away in the holiday, so I came back like three days later.

Int 07 [0:19:2.30]: Yeah, yeah, yeah. But it's a scenario based on role play exercise, where through different personas in a smart city that have certain goals and visions. People kind of layout that scenario and in that sense from that perspective build the map so they position the different values that they have, the different conflicts that they have between them amongst them or within them and in that sense, kind of build the nodes which are the values and the links which are the the conflicts between the values.

EM [0:19:33.290]: OK. So that one was uh with physical materials.

Int 07 [0:19:38.900]: Yes, but it's also an online now which, yeah.

EM [0:19:42.610]: That's. That's interesting. Yeah. It was a pity that I couldn't attend that one.

Int 07 [0:19:48.10]: Yeah, but it's also important to have a holiday, yeah.

EM [0:19:52.260]: And for example, when you say that they play out the the scenarios, is it like a role play game?

Int 07 [0:20:0.670]: Yes.

EM [0:20:3.720]: So they they whole tool, well, well, the workshop. Would you call it that? It's kind of a game or not really? I'm just trying to picture it the.

Int 07 [0:20:16.110]: Yeah, yeah, no, it's not really a game. And that sense I would really call it a workshop format and, Yeah, I'm thinking now. Could you compare it to a game? No. They get, like a vignette. Like a 2, two pitch scenario kind of to immerse themselves in this future city. And then per persona they get like 2 pages of information on the person to really immerse themselves into these roles and and from that point onwards, they kind of build a network of conflicts and work through the controversies that they find themselves within that scenario.

EM [0:20:51.760]: So every of the participant has to come up with their own dilemmas and controversies?

Int 07 [0:20:59.970]: Yeah, they identify them jointly so they get their core kind of description of the persona from that. They distill their core goals and values. And then when they have mapped it out on a board so that everybody can see each other's core goals and values, they start to kind of bring them in relation to each other and understand where the the conflicts may arise.

EM [0:21:24.510]: That's. Yeah, sounds like a fun workshop. Ohm and then from I mean during your research, because at least from what I've I haven't found that many, but maybe you are. I mean you're the expert and have you come up with a or find out any tools or methods that also address these controversies.

Int 07 [0:21:52.570]: Uhm, tools and methods that address controversies. Well, I think there is you're of course familiar with [redacted] dilemma driven design, right? It's another way to address conflict at different type of conflict. And then [redacted], we've also spoke to, she created the dilemma cube, the I think she's probably also spoken to her about that. So those are other means to address conflict. And I think if you go in a very different realm conflict studies for example, they also very often use role play and scenarios to address or work through certain conflicts, so those are other other means out there, yeah.

EM [0:22:29.420]: OK, what did you say it was the the the area.

Int 07 [0:22:34.730]: Conflict studies. Yeah, it's really different. It's coming more from anthropology, sociology, internal international relations. But if you look at multi stakeholder conflict, that's also very interesting, but it's more concerning peace building and international conflict, but it's still inspiring to to look at.

EM [0:22:51.440]: So, OK, thanks. I will look into that. Umm well, I think we have covered all of my questions. Is there anything else that you would like to share?

Int 07 [0:23:3.720]: No. Not at the top of my head? No.

EM [0:23:6.530]: OK. Any questions that you have for me?

EM[0:0:0.0]: Yes, now it works. Umm. Well to start, uh [redacted]. Could you give a brief introduction of yourself and your expertise?

Int08 [0:0:10.110]: Yep. Yeah. So I'm. I'm [redacted]. I work at the [redacted]. Since around two years. I'm a [redacted] So I run. I've ran three projects in my first year and I'm still running a continuation project in the second year. I have previously worked with [redacted], [redacted] as a a grand coordinator, so I'm I'm quite well versed in the in the grand sector of the European grants and those collaborations as well. I like working on the, on the mobility sector as well because it's a it's quite, yeah, difficult to work in. There's lots of different stakeholders. I have a background in business administration so I can apply it quite well to to the different sectors and try to see like how can we bring people together. And right now I'm are still doing a a hub project which is also quite interesting I think for this case but, yeah, I. I've I've done loads of different things in the over the last few years and yeah, it's. We'll see what pops up when we're talking about the case. What's the most relevant? Yeah.

EM [0:1:20.970]: OK, yeah, whatever you feel comfortable to share. It's more than welcome. Ohh, but then if we are going to focus on multi stakeholder collaboration, perhaps if you can choose one that it's a smart city related and could you briefly describe this project?

Int08 [0:1:37.340]: Yeah, I think the one that springs to mind when I saw the question in your e-mail was the [redacted] project, which is a project about basically digitalizing the streets. So we'd like to in the project the goal was to make navigation better and more aligned with basically trying to get users to do different things. So we asked them a question like would you take a more sustainable route or would you like to sacrifice travel time to to actually make the city more livable? So that's the project that brings to mind when I'm talking about also about difficult stakeholder collaborations. It was a project with multiple cities, so the cities involved where [redacted] and [redacted]. Umm. And also two Tech Partners, one of the was tom-tom and the other one is [redacted]. And we as [redacted] were involved as [redacted] as well as [redacted], [redacted]. And the [redacted] from from [redacted] as well. So we had this, this entire group basically and we working together on, yeah, trialing different ways to influence users in the [redacted] case via an app. The [redacted] app. So asking them there and in the [redacted] case we had a group of pilot users basically driving around their [redacted] and they would get pop-ups in their heads up display asking them to slow down for example, school zone and we measure compliance for that. Umm, so that's basically I think a bit of the background of the project and what we were doing. So would you like to specifically know like the difficult point or?

EM [0:3:25.70]: We will probably go through it, but yeah, my my first question about this project is how do they come to to exist?

Int08 [0:3:33.670]: Yeah, usually we have been in [redacted] for a while, [redacted] is a basically a grant organization or structure from the [redacted] They put the grant forward and they asked the kick of mobility to be founded and they have grants for mobility related projects and we, as [redacted] are core partners. So we were there when it was founded and have been participating in it since the start, which is a couple of years now. And basically around these themes, we get a researchers and cities and mobility partners and try to, yeah, start a projects to to apply for these grants as well. So we look at for example the city of [redacted] and we see like or we ask them what kind of problems are you running into right now, what are the most urgent problems, what kind of questions would you like answered and then we start looking for researchers that are doing research in this field. And because we work a lot with [redacted] and [redacted] because they are founding universities. So that makes sense as an institute. Basically, we found some researchers and then we looked at cities that we are well known with and we bring them together to to look at if we are able to to. Yeah, basically answer this question. If we have a group that's complete enough to be able to fill in the proposal, agree on a mission and then try to get this project going. Umm, but it's also quite the lengthy process. As I understood my colleague Tom for from [redacted] he started these projects so I was brought on to basically manage them from when they were. Yeah, agreed upon so they were OK. And basically it's a lengthy process. If it's about 1 1/2 years of writing from writing to actual actually starting the project. So it's also quite yeah, a time where things basically maybe even sitting down a bit on people's minds on what was originally discussed. So

it's also difficult to get this mission back in so I I feel that sometimes the original mission or the idea when the project was started or when its inception was there basically that they are also already lost by the time that project starts. I think that's also one of the difficult things to. Yeah, to keep people engaged and making sure that everybody is just as motivated as you are to finalize these projects. But basically it's it's a long process from from grant call, Basically to looking at partners to filling in a proposal and trying to get the right people together.

EM [0:6:26.730]: And for example, during these uh development of the grants. How do you deal with the different views of the multiple stakeholders?

Int08 [0:6:36.150]: Hmm. Umm, we yeah, usually work quite good, good at this because we are in the middle as like a bit of a neutral partner. Umm, because we don't really have a a for profit assignment or a, we're just interested in the knowledge basically. So usually we just go around and start pitching the ideas of what do we have. I noticed that sometimes there are. How do you call it? Yeah, there's basically we are making concessions in terms of wording of things. So for example, there's a strong mission where you want to implement these, for example, knowledge. Now just that we had in [redacted] and then you see that in the wording of the project proposal, it ends up like we would like to investigate mechanisms of influencing behavior or something like that, which is still very high over and then basically it works on both. [redacted] can agree on that, but then in the end, when the project needs to happen, it's gives you a bit less of a of a footing. So I think that's my personal opinion as well that that's something that you should really, yeah, talk or talk about a bit more in depth as well and not really pass over and try to find the wording that's so vague that basically everyone can agree on it. I think that's one of the weaknesses of of the proposals that I see a lot as well, especially about [redacted] time as well. That there are. Yeah. I mean, everyone would agree with that it's a good thing to do because it's very much on ideologies, big grand themes of innovation and behavior and mobility, which are all things that of course companies would like to contribute to. But then the specific acts of contribution or the different viewpoints, they are not really, Yeah, talked about yet in that phase, which means that once the actual work needs to be done and you need to get the deliverables done, it's still a bit of a difficult discussion because there are of course resources involved, different views. Uh, you have to you have to. Basically the the partners such as [redacted] or [redacted] who have four profit assignments or they need to make profits eventually. So they have difficulty sharing data, they have problems with sometimes collaborating in terms of letting other people look into the the backbone of their systems and how things work. What can you share and what not and? Yeah. So that's basically something that I think that's. We we handled it in the sense that all of the partners were there. We had the mission aligned. Umm and we also got the the grants for the project obviously because we we conducted them. But yeah, I think that it should be sharper in that face if if that makes sense. So a bit more factual, yeah.

EM [0:10:3.890]: And for example, for supporting all of these processes and these discussions of getting everyone to agree, Umm do you have this process just by conversations like discussing among each other?

Int08 [0:10:9.590]: Yeah, usually we have a core group basically that starts off with the project idea. So that's usually us and knowledge partner. And then we engage in conversation with the [redacted] on like, what are they they looking for in terms of the grant? What kind of core conditions do they have? And then we try to engage other partners as well. And then we usually have around three or maybe four people. If it's a really big project that are working together to basically write up the project proposal and have talks with all of the individual partners and then basically for these projects, we were in the lead, so we had the talks with all the individual partners. And then the yeah, the basically the structure of the project and and what we're gonna actually do was. Yeah, discussing this core group of three, three people and they then, yeah, help the writing, umm, together with us, umm, the proposal. And that was eventually with, I think 2 meetings it was a concluded that it was OK. It was a bit of back and forth in terms of some definitions or or different deliverable titles, stuff like that. But yeah, usually it happens like that. So it's sort of small core group that basically, yeah, pitches the ball and says like, this is how we're like, we'd like to do it. And then the other partners reflect on it and see. Yeah. Is the role that we were given based on the information that we provided and the the request that were answered basically because they they sometimes ask as well like we need a bit of information on what you're gonna do, for example, as a [redacted], what are you going to do in this project, what can

you contribute? And then they take that text and rewrite it into a project proposal as the role of the partner. So it's a bit of back and forth, but yeah, it's it's basically between this small group to keep it efficient, I believe as well because yeah, interfacing with so many partners it's it's quite of a hassle because it's I think in this project it was nine partners, I have different one as well with 20 and that one is. Yeah, I mean to interface with everyone and to get them all to agree, yeah, that's a lot of work.

EM [0:12:26.100]: Yeah, I can imagine. And for example, with this within this small core group, do you also define the scope of the project?

Int08 [0:12:34.880]: Yeah. Yeah, that's a usually with the, with the most important partners in terms of executing the actual work. So where we're gonna do it, what we're gonna look at. So the basically the cities, the researchers and the commercial parties with these three groups, we decide like what's the, first we decide what's the research question so what kind of research would we would we like to do? Which area? And then we look at what are the possibilities based on the information that for example, [redacted] and [redacted] have provided in this case, so we pitched them our research area and then they look at like what kind of data can we provide, what kind of stuff can we do? And then that's being evaluated and then put into a into writing, yeah.

EM [0:13:23.370]: OK. And during this whole process how do you deal whenever there are conflicting views from the different stakeholders?

Int08 [0:13:33.170]: Hmm yeah. Umm. Usually we we talk it out. Yeah, I would say but. Yeah, conflicting views. I think usually it it didn't happen that much yet, to be honest, looking at the process so far that I've had as well. It's also the space is very open as well, like the granting space and trying to do these projects in the [redacted] So I'd say that for example, I was just asked for a contribution of [redacted] to a certain project for [redacted] of the of the [redacted] and they basically saw some of our work on smart cities and they'd like to, yeah, get the experience into the project as well. So they just asked us, like, is there something you can do to contribute to that? And we came up with some some courses or some information sharing on on this project. So it's very, there's like no way not to agree with that because it's just knowledge sharing for us and it's we get a bit of insight in the project as well in return. So it's not really that much of a point to be conflicted about. I think the only thing was that sometimes budgets can be a bit of a difficult topic, so some people are a lot more expensive than others, especially commercial parties they, but the granting rules are also quite clear in this and and say that they you can't use the commercial rates, so the rates need to be the internal rates for your actual people. So that's also something that we are able to use so that the the kind of granting handbook from from [redacted] saying like which kind of rules are there, what kind of stuff can you do and can't do? But. But looking at, yeah, basically, if there's opposing viewpoints, we always, yeah, have a meeting, talk it out, look at the different. The. Yeah, but I mean looking back at it, I think the compatibility of the partners is also the most important. So looking at what kind of group we are going to, yeah, put together. We have our own portfolio of parties that we worked with kind of a lot already in different projects, different cities, different, yeah, fields of of work as well, because mobility is just one of the things that [redacted] Institute is working on. Umm that. I think we were able to, yeah, quite clearly see like what this partner be interested in a topic such as this and and would be would they be able to agree on it. And then usually there's not that many conflicts that arise actually when when we have these partners already kind of preselected. And otherwise, if there is no compatibility, that's also possible that they just say no and they're on their way, basically. So yeah, of course there's a couple of them being approached for a project such as this, but yeah, in the end we just look at who's most enthusiastic, who aligns the best with the with the rest of the group, and that usually avoids conflict already. I think looking back, I haven't really heard of or seen any conflict there. Like any hard conflict in a sense of people really not able to work with each other or not able to talk it out. I'm just really thinking really hard. If I can find a conflict situation in my memory for you to to dissect. Uh.

EM [0:17:4.800]: Uh, it's it doesn't matter if you cannot come up with one right now. Because, well, what I'm going now into the the interview, it's whether this discussions or this collaboration between the different stakeholders, what it's at conflict is the values that each one of the parties has. And has it ever happened that there might be a discussion similar to this? Maybe it doesn't escalate to a full-fledged conflict, but maybe just a discussion.

Int08 [0:17:34.620]: Yeah, yeah, we we had plenty of discussions on in a different project, for example, [redacted] which is our hub project with 20, 20 stakeholders. We had lots of discussions as well between the, we have a couple of mobility providers there that are operating the hubs and in the Netherlands, that's one of them is [redacted]. And they had a a good discussion with one of the partners from from, I think, [redacted] or [redacted] about like how to run a hub and what kind of business models and stuff like that. And they don't always agree, but since they're also quite containerized in the sense that they are operating the hubs in Netherlands and the other ones in [redacted] and [redacted], so of [redacted] and [redacted], so it's not that much of an issue, but, yeah. I'm thinking like, this discussion happened a lot as well, but I think most of the people are very professional so the discussions are not. Uh. Yeah, not so, so confrontational as they usually would be, they they they can be strong personalities in the sense that I believe that it should be this way but with a bit of conflict resolution and usually it's it's also resolved as I see one case now that's coming back to me from from code to streets is that we had a discussion on what was supposed to be the content of certain work package or what kind of work was actually going to be done. In this case, it was [redacted] was struggling to deliver some of the work because of the priorities internally. So that's also something that that happens with these projects. They they are for profit of course so the actual work of the team goes in front of the project work basically, which I see as an innovation activity. But still the project needs to be done before the end of the year because otherwise the grant ends and basically you haven't done the project, so you get less grants as well. And so we had a talk together with them and the city of [redacted] was very, yeah, annoyed by their lack of basically providing support and commitment to the project. And I think in the end there was quite good that we opened the discussion as well and not like let it linger and just wait until the end of the year and and then see that there was a reduction in the grant because it wasn't appointed or pointed out. And yeah, it was just a good discussion and I think it was de-escalated quite well as well. They explained like what their problem was. We explained what our conditions were, what kind of expectations we had in terms of that commitment. And yeah, it was agreed upon that it needed to be better as well. And from that moment on, they did better. Umm, so I think that that's one of the conflicts that I can remember that was, yeah, a bit annoying to discuss because you're expected if you sign up for a project, or at least I expect that that everybody is contribute, committed to the end goal and and wants to get this done, but that's not always the case. And sometimes because of external pressures from the company itself as well, if they need to develop something for their app or their actual customers then, yeah, it's a lot more important for them than a grant maybe 150 K, which is like nothing in comparison to the to the revenues that there are usually having. So that kind of makes sense, but it can be difficult for a small institute that is focused on the research basically and wants to get that project. Yeah, successfully completed now.

EM [0:21:16.410]: Yeah, I can imagine. And doing the this projects. Uh, do the citizens are ever involved in those?

Int08 [0:21:24.890]: Yes. Uh, we had, or at least in a in a pilot situation. So the the citizens were trying out the the app and also driving route in the cars. This project, so they were involved in we had a couple of surveys and some interviews as well to check like how they they experience it and what kind of feedback do they have. And in some of the projects, we also involve them to co-create, yeah, different solutions. So for example, [redacted] we had a Co-creation workshop in Lisbon which where we used, we hosted a session where citizens were able to come and see what kind of things are you missing in this space, what kind of modalities would you like to see in terms of bikes, scooters, etc. And would you and then we were able to basically ask them like what are you missing? How would you fill in this space and what would you like as a resident of the city? And it was actually very interesting to see like how people view mobility hubs as well from a different perspective. So that people that we're not really using shared mobility, they wanted the public toilet most of all and free Wi-Fi. So they see it as basically a generic public space and the people that were actually using shared mobility they wanted I think some extra scooters or something because they saw that they were using usually rented out so it's it's very funny to see like the different groups of people have very different demands in terms of if they are using it themselves, yes or no. But yeah, that was I think, very interesting and I think definitely from the experience I wanted to incorporate citizens a lot more from from that moment on because it's a it was good. We got some nice insights and I think the end product. So the hub itself is also better because of, yeah, not just looking at the experts and, but also just looking at the regular neighborhood people passing by and trying to get their experiences.

EM [0:23:28.950]: That's interesting. And for example, the feedback that you get from the citizens. Does it reintegrate into the project or it's just more like a final result of the, of the whole project?

Int08 [0:23:44.410]: For uh, the co-creation session, it was really integrated because it was used to to basically [redacted] it was a bit of an evaluation. But we also had a moment in between where, for example, we looked at how happy are you with the features that we have right now? What are you missing in the app? And then we try to build one or two more features to actually get them to use it more. So that's where it was used as well, but it was also mainly used in the finalization I think. So how did they experience the pilot? What kind of things were they missing? What went wrong? What feedback do they have, stuff like that? So it was a bit of a combination in the project, yeah.

EM [0:24:32.390]: OK. And for example, these citizens that were part of the of the sessions. How would you describe the reaction to this new technology as being applied to their everyday lives?

Int08 [0:24:48.310]: I think it depends. Yeah, that's a good thing. I can't really answer the one from the [redacted] one because I wasn't there personally, so I don't know. I just heard the stories, of course. But for the other one, for [redacted] we, let's see, yeah, basically we asked already, like we did some recruitment campaigns to to get people to use the actual app. So we were looking at people who are living in [redacted] or [redacted] and they were able to travel around by car. So that limits the group a bit already. But usually the the the the group was quite, yeah, enthusiastic about trying stuff and then trying to because they were. I think most of them were like early adopters in terms of a personality type because they were used to or they were at least agreeing to install a new app, follow different routes, be influenced, get surveyed. So it's also a certain group of people I think that you attract for these sort of experiment. So it might influence the picture a bit, but most of them were quite interested. Some were a bit skeptical, like we got some skeptical reactions as well from people saying like, should you really determine what kind of route I will, I'm going to use because of a sustainability or livability perspective? And others were, yeah, really happy that we were able to incorporate, for example, school zones in navigation app so that you are redirected to bit more often and yeah, make the schools areas a bit safer for children to pass streets. So it was mixed. But yeah, very interesting. I think both perspectives are very valid. So what should the city determine and how should they guide their citizens? Or should they even be able to influence their citizens in navigating through the city? Uh, it's valid questions, yeah.

EM [0:26:51.560]: During the projects that you've been involved in, I mean by the end of the project has one of them ever received some kind of backlash or resistance from the from the citizens?

Int08 [0:27:3.350]: Umm. No, no. All of them basically the pilot ended and then that was it. We submitted the results and I think most of them were quite well received. We didn't get any negative publicity. I do know that the [redacted] project for example, was kind of intellectually continued so that the the thought behind it is is being developed into an infrastructure model for Amsterdam, so they are still looking at monitoring the digital space, trying to redirect flows of traffic and people and other things in general, basically based on certain conditions. And I think that's the entire idea behind that project. So trying to steer things based on data to improve parameters of the city which the city finds important such as safety or livability or air quality or, yeah, basically anything you really want, you can you can possibly influence. So they're still working on that and there are developing a platform for doing that.

EM [0:28:13.350]: For example, what you were mentioning. Of these beliefs or values that they municipality advocate for. They share them with you or is it part of the requirements that you must include them throughout the proposal?

Int08 [0:28:29.940]: Umm, I think they the they're in the proposal for sure, but they are very generic in there. So it's safety, livability, they were the, the the values basically in the proposal. So they shared those with us but there was, yeah. There was a specific use case. There was already being discussed in the original project plan that remember now that originally we wanted to investigate the the key walls and bridges of [redacted] because there are quite vulnerable for, you see them collapsing quite a lot right now. So the walls of the canals, basically. And we want to check like can we redirect people

to reduce the load on the bridges and the the key walls of the of the city? And, but unfortunately that was bit difficult because the we we looked into the use case and when we started the project and it turned out that basically the the things that impacted the most are the trucks and the transports and they have already their own navigation software and preplanned routes basically based on the yeah, very different scheduling mechanic. So they're not really compatible with [redacted] or [redacted] car. So that made the use case disqualified in terms of the technology. But yeah, that's uh, that was one that was already discussed. So that was in the proposal. But yeah, in the end, we took up a livability the school zones case and as well as trying to reduce the amount of cars that were actually going through neighborhoods trying to get them via ring roads. That was the other use case that we came up with in the end, that was operationalized from the basically the safety and livability, yeah, terms that were used in the proposal.

EM [0:30:20.530]: OK, very interesting. And now if we go back to something that you were saying before about, uh, different strategies for conflict resolution. Umm, could you talk a bit more about this? I mean, I would imagine it's more of your field than mine.

Int08 [0:30:37.780]: Umm yeah, I'm I'm not too sure about that, but I can try but, yeah, usually. I'm personally. I'm not. I'm I'm really a conflict averse. And so as a person, so I really, I'll try to yeah, basically facilitate things in the background to make sure that they just resolved themselves. That's usually my style.

EM [0:31:0.640]: OK. And how do you usually do that? Like which actions or measures do you take for preventing?

Int08 [0:31:6.950]: Umm, it depends a bit on the conflict I think as well, but usually I try to make sure that, uhm, let's see. I find a middle ground or try to find a middle ground myself. So basically think of the entire conflict and then try to find a solution already where both parties would be happy and then try to suggest that. That's usually how I do it. But I, yeah, recently find found out as well that it takes a lot of effort and yeah, puts too much responsibility on a single person while the conflict is not even for example, between yourself and the other parties. But I just because I'm the one responsible for finishing the project as a project manager I also feel responsible for making sure that conflicts are resolved and that everybody is happy and the project. But yeah, that was, uh, was a bit too much for me as well. So now I also look forward to to trying different ways of conflict resolution by just giving the question back like, why wouldn't you be able to do this? If they state that they're not able to do it and then ask them like. Why wouldn't you be able to do this? And originally we agreed on that with this will be the deliverable. So state the outcome and then see like what's gonna happen and usually what I found out was that people were actually quite capable of finding solutions themselves as well. If they're declining, for example, to do a piece of work because they're too busy. And if you put the ball in their court, I think it, yeah, they know most about their work as well. So it helps in finding efficient solutions when there's a conflict, such as not being able to to deliver or disagreement in values as well. So yeah, that's a personal lesson for me, I think as well over the past, yeah, half a year or something that you shouldn't try to answer every question for, for, for the other parties as well because they are also quite capable of themselves and. Yeah. So it's not really efficient to to try to put all of the work on their own shoulders. In a sense, yeah. But yeah, and I still like hosting a lot of sessions as well around these, so if there's a conflict then, umm, usually well, what are, or mine, the project manager from [redacted] that was that was collaborating with, your style as well was that uh, and so if something were about to go wrong, or if there was a conflict hanging in the air, we would host a lot, a bunch of working sessions and just work it through together. So bring them into the same session and have them work on it live instead of having everyone basically submit their own work separately. Because then they look into, Yeah. What things they are both doing at the same time and and when there's stuff that's difficult for them or they need to help the other partner, they can just ask it straight away instead of having to go through sort of formal procedure of trying to request the information or, Uh, semi have semi formal working relationships even though you're part of a kind of a team. So that's why we tried to set up these working sessions to so that we have regular checkups where they are able to sit together, work through it and then. Yeah, maybe even deal with the conflict themselves, because then yeah, they need to finish it and they feel that we also expect them to finish it because we set up these sessions for them to basically force them to work together. And that that's also quite successful usually, but it it is very intense from a project management perspective because

you need to host all these sessions and make sure that everybody attends and basically agendas are aligned. So that's also. Yeah, I mean, conflicts usually take time. So in a sense that's not really strange. Yeah.

EM [0:35:2.130]: Yeah, and during these sessions. Uh, how are they structured?

Int08 [0:35:6.990]: Umm, usually we look at the goal, I like to to put the goal first. So in this project you have to deliverables, which are basically being assessed like how complete are they, what kind of things are missing and did you investigate everything that you were going to in terms of research? So for example, they are, the projects are structured in work packages which have different partners working on different deliverables and then for the sessions I usually put the deliverable first, so I look at like what have we promised in the in the proposal, what kind of things were we gonna deliver and then put that forward and say like, OK, this is the goal, this is the date. Now let's plan back and what kind of things are we basically missing or what, What are the potential problems that we're running into when we're looking at achieving this deliverable by this date? And then we start looking at like the obstacles and the hurdles. Umm, in terms of if there's a conflict, for example between time or. Yeah. What, what they're able to do and what they originally promised. And we tried to find a way to to deliver the most value or we determine together basically what was the most valuable part of the deliverable and then scoped it a bit different than what it originally was. But yeah, basically usually I host these in terms of that I tried to find experts that are also, for example if there's an issue in terms of getting the work done, I look at what kind of experts do we have in-house or who is the most knowledgeable on the subject that can actually lead the technical discussion and try to also bring them in if it's not something that's just a management kind of thing, then usually I like to have the backup of, for example, data guy or. Yeah, basically someone who is, who is really knowledgeable about the subject, that's. Yeah, yeah. Difficult to achieve, yeah.

EM [0:37:11.520]: And just to picture it more clearly. Are you having this sessions like everyone is just sitting around on their laptops discussing or do you use any kind of materials?

Int08 [0:37:24.850]: Now usually it's digital because these projects are international, so we have different cities as well. So we try to meet or we try to meet at least once a year. But yeah, it was already quite difficult. The project was also started doing COVID times. That was a bit more difficult, even still. Which was really, really difficult to. If people haven't seen each other, then it's, the conflicts are arise a lot sooner and a lot more severe I think. Uh, than before covid when you would have seen each other at least once and get a bit of personal accountability as well. Somehow. So usually it's digital meeting. So we use the, or at least I'd like to use the MIRO boards a lot. Or MURAL. Both of them are fine. It depends on which your organization you work for, which ones are being used in terms of licenses, but, yeah, they're nice. I like to, Uh uh, prepare a bit of a board there and look at, for example, objectives what each partner needs to do and try to plan it together. I think that really helpful tools for. Yeah, getting these, these things mapped out and also having people contribute themselves by, for example, hosting a session where you asked them to, to look at, for example, use cases or, uhm, what kind of stuff they would want to investigate as a as a person that it, at their company and just try to group them together and see like, what's the general picture and what do we all agree on? I think that really helped. Now. OK, good to know. Yeah, it's more clear now. Thanks. Yeah, yeah.

EM [0:39:5.430]: Well, I think we have covered all of my questions. Do you happen to have anything on mind that you would like to still share about the how to manage multi stakeholder collaboration?

Int08 [0:39:17.920]: Umm. I'm thinking like what's a good thing to do, to still mention. Yeah, in general, I think it's a very different difficult topics. I'm also interested in what you're gonna come up with in, in terms of the tools and models that we're able, to are able to help because. I think in the end it's a it's always quite difficult to. UM to bring them to a successful end if they are not, it depends on a lot of different things where the project can go wrong so it can be wrong in the exception that there's not enough alignment in the values that can go wrong in the execution that there is not enough priority at the moment. Too many stakeholders, for example, is also difficult issue. And then of course. Let's see. Yeah, external factors as well. So just covid. Yeah, people falling ill and it's also one of the annoying factors I had was, for example, couple colleagues being either burned out or not available

because of the labor shortage. Which is also very difficult if you have only one year to to complete such a project so. There's lots of a lot of factors that are influencing the the success of such such a project, so that's why I'm also interested in what kind of things you're gonna distill from from these conversations and. Uh, yeah. How you're gonna make mix soup of it, basically. Yeah. Yeah, but if you're a yeah, reading at the project. Did I tell you enough about the projects that I've that you've seen from from what I've worked on or you still missing anything? Umm.

EM [0:41:7.150]: I think I have enough information, what I'll be doing with all of these interviews that I've been conducting is that the end goal of my master thesis, Well, I'm doing industrial design engineering.

Int08 [0:41:20.30]: How nice.

EM [0:41:21.40]: So now I want to end my thesis with some kind of tool kit that can support these discussions, among the multistakeholder collaborations where every everyone has a different perspective and probably a different interest. And how to have this discussion surrounding values given that they are all working on a smart city related technologies which can be a very delicate subject. Yeah.

Int08 [0:41:47.830]: True true yeah, no, especially on those on the subjective data sharing and all the GDPR rules, et cetera, they already. I also spent a lot of now that pops up. I spent a lot of time doing a partnership agreement as well between the consortium. So I spent like a couple months discussing with legal from all of the different partners like how can we share data, what can we agree upon on the ownership of the results. Stuff like that and just have them in in paper, written in on paper as well as data processing agreement. So that's a really in-depth subject, but it was important because otherwise they wouldn't share any data with each other when it was not legally put into writing, it was especially a problem of the commercial partners and the other partners as well, because, for example, [redacted] is as a municipality quite under the investigation of a lot of instances because data sharing breaches in the past, so they need to make sure that things go well. So that was also quite important. Yeah. Yeah. Umm.

EM [0:43:0.920]: Yeah, sounds very, very challenging from what I've heard. When the different interviews, it's it can get quite delicate the conversation. But yeah.

Int08 [0:43:10.50]: Yeah. Yeah, that's it. That's that's true. Yeah, that's it's an interesting field as well. I mean, I haven't been in there too long now. Two years as a project manager here and then working on the grant granting side of things earlier. But before that, I worked at a bank and it was much simpler. It's just doing your job and making sure that, yeah, basically you satisfy your internal stakeholders, which is a way less delicate situation because you're working for the same company. So there's no need for value alignment in that sense, so. Yeah, that helps. And it's the the difficult thing with these things is just as a personal view. I think the most difficult thing I think I see here is that you're not working for the same company. So there's like no way to escalate or if things go wrong, there's no way to. You really need to handle the conflicts yourself. And that's difficult sometimes, yeah.

EM [0:44:3.550]: Yeah, it can be very challenging.

EM [0:1:19.180]: OK, so to start, could you be give me a brief introduction of yourself and your expertise?

Int09 [0:1:26.460]: Umm, yes, I'm [redacted]. I'm an architect. Studied architecture back in [redacted] and worked a bit afterwards and during the studies in a small studio so I could do a lot of different topics. The budgeting, design, site supervision, etcetera. After that I studied a master in smart cities. Uh, it's under [redacted], so I could. Started different programs in different universities in [redacted] and [redacted]. Well, [redacted]. Each university had its own expertise area, so in [redacted] it was more focused on energy efficiency in buildings, while in [redacted] was towards a sustainable urban planning or smart urban planning. And in [redacted] it was focused on energy systems and renewable energy integration with the city. And the idea thesis of a strategic, yeah, indicators of smartness in developing countries with rapid urbanization. How can we integrate some parameters in cities that develop really quickly and now I'm working as a researcher in [redacted] since March of this year. So yeah, almost seven months ago. Umm, I'm working in different projects so the main one I'm involved in is called open lab, so it's a [redacted] project. It's 3 neighborhoods towards positive energy, which means this energy these neighborhoods produce more energy than they consume so they can share. And that's the idea to integrate other buildings outside the area to these to these systems. Yeah, this is what I'm mainly working on right now. I have other projects but. A bit in a different context, maybe more into. Policy and another one towards sensoring smart buildings. So yeah, that's why I want working right now.

EM [0:4:33.240]: And from the projects that you're working on, which one would you say has the most challenging, horrible collaboration within the stakeholders?

Int09 [0:4:43.460]: Yeah, I will say [redacted] the main one I'm working on. So probably half my days are going on that project. It's an open innovation living lab, which means. In for its a project for four years and 1/2 and the last two years the idea is to monitor and explore. What we have been installed, so it's like. Yeah. And the concept of a living project, meaning we can experiment in real time with real consumers and real inhabitants in, in the buildings, the best options and the optimization of what the energy systems can bring or provide. Umm M and in that project it has a framework of. And I don't know. They like innovation, collaboration of four helixes, meaning we have the industry, we have a government, we have the citizens and the academia from both research institutions and universities in three different countries. So the collaboration in in countries really different also. So there's people I would say probably in Spain and Belgium, it's the collaboration with citizens is more. It's a bit easier and people is more willing to collaborate, collaborate while in [redacted] is quite different because they are. Yeah, they don't trust so easily government or the surveys or people just asking them questions. Sometimes they are really not, uh. Yeah. So friendly or willing to give data. Umm. But yeah, the three of them are really challenging because we have co-designing and Co-creation sessions the first year. With the four different helixes, well, the academia leads the co-creation with the this three other groups, the citizens, the industry and the government. Umm, so we do a lot of workshops and we try to collaborate first individually and then when we choose like the ambassadors of each group, we try to connect them and try to make them communicate and integrate the project. Umm, so yeah, this is what it's more or less the project about.

EM [0:7:16.200]: No, very interesting. And how does this project come to be or how do they define the the scope of the intervention for the four years?

Int09 [0:7:26.260]: So I mean originally was a call from European, the European Commission. The idea was to have three projects. [redacted] so we are three different projects. [redacted] cover different countries and each of them try to cover different areas of Europe. To try to test different things and to yeah to gather different kind of data that probably can be spread in their own type of climate or the own type of. Yeah, culture, community, etcetera.

Umm. But yeah, I mean it's a project that was created three years ago. They apply for the call in the European Commission in the open call, well in the call. And they we got awarded the funding, so the project started one year ago. Yeah, we're finishing right now the first year of the project. Ohm and actually in this project or each [redacted] in each country has different funding. Some part from this European Commission fund. Some local funding, some are investments from private sector. So it's a gathering of different types of funding.

EM [0:8:59.140]: And how does every country decides what they are going to be focusing on?

Int09 [0:9:7.570]: The proposal when you apply for the project you have already a target, some targets. What do you want to achieve? Some objectives, those objectives were already defined. Umm, with the local government and the academia in the local city and the industry. So let's say I think I will say from the proposal and when you're writing and working it out, you don't really take into account the citizens. But in the first year, it was already planned to have sessions with the citizens, so it's like you have some objectives, but the really technical towards energy savings, CO savings. What type of materials, what type of technology, et cetera? But these are of course needed to be integrated with the needs of a citizen and the needs of the inhabitant of the building. So that's why the first year it's just for design and parallel the citizen inputs and the the sessions with the citizen, while the 2nd and the 3rd year is for the renovation and the works. And the fourth third well during the 3rd and the 4th is monitoring. And yeah, experimenting with the sensor that we will install. So yeah, that's some more or less like the evolution of the project.

EM [0:10:32.680]: OK. And within these quadruple Helix, does it ever happen that the different parties have conflicting views?

Int09 [0:10:42.400]: Yes, yes, yes, yes. Especially if, it depends. To which topic we're talking about? If it's money, if it's design, if it's needs, if it's the future of and also the role of each. For example, some houses that will be renovated are owned by the government and are rented to people, while other houses are people own the house so that their their relationship is really different because people are some are tenants and some are owners. Umm. And of course, government wants something further that works for their own city agenda. Well, for the owners is for their yeah, own interest or. Yeah. For the the best option for them. So sometimes it's really hard to understand what each one wants, so the workshops is really helping for understanding the role and the scope. But. I I see the main issue is always trust to trust the private sector, to trust the government, to trust the citizen, that he will be helping or contributing to to, for example use the thermostat the way we're planning, or to be flexible in the terms of you need to use maybe more energy in the night rather than the day to keep the balance in the grid or so. Of course there are conflicts but the the idea and people is trying more and more or less to be willing to collaborate, cooperate and trust the other people. But yeah, it's quite different in each country.

EM [0:12:32.970]: And for example, in these workshops that you were mentioning, do you plan specific activities to address this? Yeah, these multiple interests.

Int09 [0:12:46.560]: Yeah, yeah. OK. Also the difference between the three countries, it's the scale. So for example, in [redacted] it's single detached house, meaning just one house with a small garden, while in in [redacted] it's it used to be a big industrial building. Now that it will have a small apartments and housing for elder people, while in [redacted] it's a really big house of 10 stories, 10 floors UM with a lot of apartments like 300. So yeah, I mean the sessions are really different. For example, in the bigger scales like [redacted] and [redacted], they use a lot of apps, a lot of Internet like crowd mapping, online surveys, online questionnaires and this kind of things for really massive. While in [redacted] is really local, so we know it's just 30 houses, so it's really easy to approach 30 people instead of 300 people. So that's why also in the bigger ones we have ambassadors, meaning yeah, they are willing to be more active on the workshops, etcetera. And so the first sessions is to to I mean there's the open invitation who wants to be ambassador and

the people that it's following and really interested and engaged. They become, yeah, the ambassadors, representative people from each building or community.

EM [0:14:27.520]: And what kind of activities do you do during these uh workshops?

Int09 [0:14:36.470]: It's, uh, how do you say. Yeah. Participative different activities or like participative mapping and. So the first one is. Co-creation and Co-design and then in each one the first one is just to understand. What they want, how do they see their future? The second stage is to dream, so to put actions to achieve those goals. And the third one is to implement and to be realistic in terms of what can we achieve with the project and what cannot be achieved by the project. So it it's like different activities and yeah, workshops for each objective, let's say. But I will say that's like the timeline. So the first one is just to be really creative, open minded for the people. And now I'm also saying that this workshop is not only for citizens, but also for the government and the industrial partners. So each of them, they, the first stage is what do you dream of? Yeah. How do you imagine your city or this neighborhood in 10-20 years? More about like brainstorming somehow guided and then you just start to to be more focused and realistic and trying to define collective objectives etcetera.

EM [0:16:5.270]: For example, with this uh, collective objectives and these dreaming. Are there any specific methods or techniques activities that you do to get that information out of them?

Int09 [0:16:19.850]: Yes, I I need to check it more because I'm not focused on this. I'm I'm more in the technical part to be honest. So there are three partners in the project from other companies that are focused on implementing, yeah. Living labs implementing uh participatory methods and, and they're running that. So I'm just in the core. I'm supporting actually the coordination of the project. So that's why I know a bit of everything but not so into detail, but I can check it and share it to you. Yeah, I'm saying telling it it depends on each country and I need to really take on on the details of the activities and also because it was last year I joined in March so it was already started, let's say. Hmm.

EM [0:17:10.570]: And then for example, with the, since you're more on the. Can we call it project management? Yeah. How do you get all the people to agree on how to proceed with the project?

Int09 [0:17:27.660]: Hmm. Umm. It's not that complicated because we already have a structured project. Meaning we will do this kind of renovation, changing this kind of window, this kind of materials etcetera. We will try, we will try to design a bit to the exterior. And of course, in four years and 1/2, it's not enough to really achieve. The big big target of a really [redacted]. So we're we're working on towards [redacted], meaning the big long term project is in 10 years to be able to provide more energy to the city. So this is like the first stage of. Maybe 30 years project so that the the idea is like to be a seed to start developing and people has this inertia from different areas industry, government, etcetera. So it's not so hard that they agree. We already say, OK, this is our project. [redacted] is giving us money to do this and we have some targets that they are asking us to achieve. So many CO2 emissions reduction to achieve. Umm, different KPI's, I even how many people will reachm how many people is aware of what is a [redacted]? What is aware of being climate neutral or, and this kind of things. So there's already a series of parameters that we are following. So it's like we we cannot just change the project and forget about it because we don't get the money from the [redacted], let's say, so people is aware of it and yeah, it really helps to to have a draft or to have already stages and the project really well planned before we just going to to share it with a lot of people. Of course you're open to be changing some minor things or to be flexible or can you change the really long term project, but for the purpose of a four year and a half project, it's not so, so flexible you know. Since 2 years before it started, people in the course version we were we right now we are like 33. Hmm. Parties from different areas, so it's [redacted] coordinating my company. But we have. Yeah, I think, yeah, around 12. From each country, and some are more or less some I think in spring we have eight parties.

So there's an architectural firm, there's the, the city, etcetera. And we all together already plan this project. Three years ago. I mean we with [redacted]. Ohm. So yeah, I mean, I don't think it's really hard to to people to agree on it in terms of this is the project, what do you think about it? Let's talk about it and who is interested to participate and who's willing to be part of this initial process like the seed of the project, which has already a shape. But of course, the future. In 10 years, it's they're more interested in part 2. That's people can can already be engaged and be willing to to improve the project, to grow the project, to improve the project, huh?

EM [0:21:13.960]: OK, I see. And yeah, since you've been working on the project, have you ever had to deal with all those 33 parties or maybe just the ones in [redacted]?

Int09 [0:21:25.240]: Hmm yeah. I'm just trying to remember. Umm. For example, what I see, sometimes some conflicts is. A bit more technical in terms of the definition of things like for example, what is the definition of a [redacted]? What do we do with this energy that we sell? So even like legally, yeah, well, politically it's not, in some countries possible to you buy energy from another building, you always have to go through the grid. Which is from a yeah, from a company, from a distributor of energy company. Ohm. So these kind of things sometimes is it's really innovative. So people really it's hard to break some cycles and to break some structure like it's already there, but it's not only from the organization, but also physically. I mean, yeah, the energy comes from a system and you you are a bit trying to break the system and to bridge buildings, and to bridge buildings with charging stations for cars and charging stations for bikes, which it's different for the city and and of course has yeah also physical technical challenges. UM. And that's one thing. For example, another one, the political one. No, how did the city can gain something from this? And to charge some taxes and how to recover some investment in doing? No. So we also have in innovation, innovative solutions in terms of business models. Also the you know the industrial partners have to, are trying to develop new services or like new. Hmm. Yeah, not technologies only, but services. And to create a new business model of OK, this technology, how will be serving or even just to to connect to buildings. How can we make it work and financial, financial feasible financially feasible? Umm. Yeah, I mean, it's when you're talking about innovation, it's really hard and complicated to break a lot of cycles, but. Everything, I mean technically, physically, organizational. For example, one topic or one thing we were discussing in [redacted] like 3 months ago it was. These are really. Umm. Transversal project and transdisciplinary projects. So even the city it's hard to for them to align all the different departments of the city. For example you have the Energy Department, you have the urban planning department, you have the social department or etcetera. And one agrees when one thing one agrees or not. And one says no, I don't approve this. I I don't know. We needed to submit some plans, but they were not approving some things and it's really hard even from each organization to try to convey and to agree on certain topics. So for example in [redacted], what they are doing is called an office called Strategic Office. Which tries to be in touch with each department and. To somehow arrange agreements in a transversal way. Umm. But this really hard, I mean this is really innovative for [redacted] and there are really trying to push. To be the innovation, even from the organization itself, from the city's organizational structure, let's say.

EM [0:25:26.390]: very interesting and for example, how does it go when you have to deal with the governments from other countries? Like with the uh, policymakers involved maybe in [redacted] and in [redacted], do you ever have to deal with them?

Int09 [0:25:49.50]: Not yet, because we're still on the first stage, so next year in March we will start implementing and the renovating. So the project is renovation of buildings, all buildings. Umm, which is more challenging to achieve this climate positive building, because if you have just new building system, way easier to achieve it because you're plan it and you just build it. But to renovate it it's way, way more complicated. Umm. And I will say not not yet, because since the proposal the the local city was involved. So in in the three of them. So it's [] the city in [redacted], [redacted], the city in [redacted] and [redacted], the city in [redacted], the three city departments of energy

were involved in while writing the project and defining the project. So there are already aware and there's people in each city working on it. UM. But again, it's it's it's not just only the project, but what does the the project can become and what will like if we're allowing this for this project means we have to change a lot of things to allow allow or yeah make possible other types of requests from other projects you know so it's really breaking the ice project but the the cities are aware and I don't think there's a. Since they were already integrated and collaborating since three years ago, there's no a big collusion. Say yeah, like conflicts between the city and the project. Umm, I would say the biggest one. No, I mean because, there are really local. So the energy systems or the the energy provider that it's a company and the government that it's local, they were known for a long time really years long. We have this really innovative project so they say, OK, let's work on this really innovative project and try to make it work. Umm, I I I don't when you. I don't think it's a conflict right now. Maybe when they were writing the proposal and trying to think what they wanted. There then probably there were more conflicts. Umm. Yeah, but I don't think right now there's more conflicts with him.

EM [0:28:27.420]: OK. Uh and uh. I mean, in the case of one emerging, I mean, despite what party the conflict may arise with. As a project manager, do they equip you with some tools or methods to deal with these situations.

Int09 [0:28:54.510]: Yes. Yes and no. Of course, it's harder through online because everything is like meeting through teams and not so much face to face. So we're just coordinating the project. UM for the [redacted]. So we're following the next steps, the progress of each task and each report. We have to be submitting to the portal and to [redacted], but each living lab has its own leader and its own subproject management, let's say. UM. Regarding the tools. Mm-hmm. I mean, of course, they are mainly digital, but also like soft skills. I think 2 weeks ago I had a yeah, like a managerial skills seminar towards resolution of conflicts through non aggressive methods. Meaning yeah, how to deal with people that it's really angry or annoyed or not willing to collaborate or listen, et cetera. Umm from a project management perspective. Yeah. I mean, we have so many tools as project managers say. GANTT files. Umm. I mean, uh, each meeting we have, we have a follow up reporting. So we we know what should be done, what it's missing to be done and. Yeah, and. We tried to meet for per city each month or less. And they already tell us what is wrong or what is not wrong and if it's something is wrong, then we try to reach these people or this organization trying to understand why it's not working. What do they need? What kind of support they need? Yeah, I mean I right, right now I don't think there's a need of specific tools. Let's say specific methods to approach this, we try to meet once a year physically. So for example in three weeks we will meet in [redacted]. Face to face. So we have, it's called general assembly each six months. In different cities. So now we will go to [redacted]. Last year was in [redacted], next year will be in [redacted], but it's the same people, so it's also nice to meet face to face and we try to in 2-3 days have a lot of workshops and to exchange information and to discuss topics. Umm, with other partners. So for example there are tasks that it's really, yeah, technical. For example, we have digital twins that it's 3D modeling of a real house and to run simulations of energy or materials used like a lot of things. So that's like literally a digital twin. And of course, in each country they have their own methodologies and their own databases, etcetera. So we try to do a workshop that in [redacted] so people that it's involved in that topic and discuss and exchange information and exchange solutions or innovations. And the same with a lot of things policy, business plans, social developments. Umm. So I mean this, I think this helps a lot of course to have this open discussions, we have, of course, someone like if we want to share a really specific content. It's really focused and not so open discussion because it's just. OK, project management, we have to follow these. How is this going? How is the money going time etcetera? There's more sessions that are more brainstorming. And workshop style. So I think these are really helpful for the project itself.

EM [0:33:24.160]: And who plans these general assemblies?

Int09 [0:33:29.480]: [redacted] my company, but because we're the coordination of the project, we're coordinators of the project. UM. So myself and my boss, basically we do brainstorming and we see what's happening in each and some difficulties or challenges that it's. I mean, In, I don't know any specific yeah topics. So we say, OK, it would be nice to have maybe a workshop on these with these people involved on leaded by an expert, for example, if it's more the social and the co-creation part with the four helixes, there's one association called [redacted] which is leading this. So we say OK, they will be chaired, they will be the moderators of this session. And they will ask the other ones to prepare some information. We present it and then we discuss it. And the same for other topics that are happening at the same time in the three countries. Umm yeah, but I think these conversations are really, uhm, fruitful, yeah.

EM [0:34:39.230]: Sounds like a very fun job.

Int09 [0:34:42.510]: It's a lot of project management right now, I feel like. Yeah. I mean, it's project management what I'm doing. I still have the nice part, the fun part, which is to define what is a [redacted] in terms of all the topics, so we try to all agree on, OK, this is what it means. This is what we're we achieve in the end of the project. This is what we will try to get in 10 years later to try to tell the cities and the other. Yeah, associations involved to try to push and to make it grow like a little flower to put some water and to keep working on it. And yeah, and also the the potential for different parties if it grows what what's the benefit for the city in terms of not only climate targets but business targets or quality of life targets etcetera. And so also. It's really nice project in terms of there's people that it's focused on so many things, but they are not aware of a lot of things. So this is a new opportunity to understand what is transdisciplinary, what does, why this why is important to listen to the cities and why is important to understand somehow the technical part of energy systems, why it's important to understand the policy that the and the politicians in the city that allows or don't allow to to make. Yeah, new business, new exchanges and new yeah. Organization and models of things. So yeah, it's it's a fun job. Yeah.

EM [0:36:26.940]: For example, what you were mentioning about the reaching disagreements on what is a positive energy. And these other discussions. Uh, how do you get to that definition? Like is it just people talking to each other around the table or?

Int09 [0:36:44.670]: Yeah. So I mean, we had a session two months ago. Because our company. A colleague of mine is also working on really theoretical level of the definition, so she's like reading me the information and saying, OK, the experts in European level, we are saying that a [redacted] could be this or this or this. Umm, so there are some guidelines, but of course we again arrive to a conclusion of. Yeah, yeah. It's so innovative that the definition is so free that you can even say. OK, for me, it's this because it's I think a concept that started beginning of 90s consolidating in in the 2010 or so, but still there's not like an official definition from the [redacted] or from an official organization. For example, there's you can maybe achieve neighborhood of positive energy virtually, meaning you buy renewable energy from another country or area. Umm. And also it depends on the urban context meaning if it's a really high dense area. Like [redacted]. The potential for renewables is way lower than for a more rural area that has more area for solar panels or for windmills, etcetera. So. Yeah. How? How do you manage these parameters of? What's feasible and what's not feasible for each context, urban context and cities and context and cultural context so. There are clear targets. Meaning you need to reduce your demand. You need to improve your renewable energies and to increase the production of those. In order to to surpass and to to be able to do something with that energy that it's extra produce and to integrate batteries, integrate electrical vehicle charging stations. And yeah, and and try to make well so independent from the grid, meaning you are more. Umm. Let's see. Resilient. For example, the new crisis. You you don't really depend from the grid. You are like a small island of auto sufficient energy system. Which is also really interesting. UM. So there's a clear definition indeed. But it's so new and there's nothing really official and we always try to write in the paper [redacted]. Ohh or on the way, in the roadmap to [redacted] meaning at the

Appendix D

TDG concept exploration

The following tables summarise the brainstorming process for exploring the worlds of Triadic Game Design for concepts A and B. The exploration for the world of Play led to a further division with four different concepts: A1, A2, B1, and B2.

REALITY ASPECTS	*Concept A*	*Concept B*
1. Problem	The decisions made within the collaboration struggle with different time frames. The technology used today may be used differently in the long term and have an unexpected impact on city life. This discussion is not happening in all collaborations.	The design and implementation of urban technologies can be benefited from the input of citizens to further understand the impact it would have in their lives. Embracing the controversies that can emerge from discussing the intervention can create areas for innovation.
2. Factors	From TA some relevant stakeholders have been identified: policy makers, tech-developers, and citizens. The built environment and technologies need to be present. Players need to be able to express their values regarding the city and the environment.	
3. Relationships	Citizens can give input and feedback on the proposed solutions by the other stakeholders. Players should be able to iterate on their solution frame as they collect input from the citizens.	
4. Process	A negotiation process of the technology solution where depending on the setup, citizens can support or reject (according to their understanding) as the technology is implemented in the city.	

MEANING ASPECTS	*Concept A*	*Concept B*
1. Purpose	Creating a levelled knowledge field to discuss technology / Relational learning.	Design technology from a value-sensitive frame including multiple perspectives / Relational Learning
2. Strategy	Players need to discover the others' position on things, and aspire to find the common ground of acceptance while preventing a protest from the citizens (deciphering the hidden information). These need to relate to current city problems, which are only known to the policy-maker and matched to solutions from the tech-provider (use the correct resources to complete the mission).	Citizens get to inhabit their city, identify the values they share and explore different spaces around the city (conquer territories). Players can also leave to other spaces in the city if the technology installed does not meet their vision of where they want to live (explore new territories).
3. Operations	▪ Discover the hidden information ▪ Negotiate what is accepted/rejected: component expressing the rejection ▪ Allow players to ban words ▪ "Building" the space through their values	▪ Place values in different spaces of the city as "conquering" ▪ Intervene the city according to what is shown in the table, as in "invading with technology" ▪ Fit the solution to the diversity of citizens' values
4. Context	Who? For practitioners involved in smart city collaborations and the societal sphere. Where? In workshops, city labs or participatory session	Who? For practitioners involved in smart city collaborations and the scientific practice Where? In team sessions or workshops

PLAY ASPECTS	*Concept A1*	*Concept A2*
1. Goal	Strategy and negotiation game. In-game goal: create a public space with technology that all citizen roles want to visit. The goal is met if all citizens support the intervention and no protests are happening (no rejection).	Negotiation and building game. In-game goal: identify values at risk by city's problems, propose a solution that does not get rejected by citizens. The goal is met if the built interventions satisfy the values of citizens.
2. Gameplay	Taking on roles, players have to negotiate the technology and policy for their fictional neighbourhood. By moving from 'private' to a 'public space', players can move their resident cards according to how much these fictional characters would agree with the smart city proposal. Giving over technical explanations that nobody understands can make some residents want to stay in their houses or start a protest against it.	Players need to understand, design, and frame interventions that address the problems their fictional city is facing. By stacking cubes, citizens, policy makers and tech developers, can collaborate as they 'build' their intervention together. However, citizens are allowed to ban overcomplicated words, if too many words are banned the game will come to an end even if there are problems left unattended.
3. Gameworld		
4. Technology	Analogue game. Boards, drawing pads, cards, and tokens	Analogue game. Board, drawing pads, cards, and cube tokens

PLAY ASPECTS	*Concept B1*	*Concept B2*
1. Goal	Card placement game. In-game goal: create smart buildings that fit the values of the residents. The goal is met if technology is able to be implemented according to the values of its residents instead of installed in empty buildings.	Conquering territory game. In-game goal: create urban interventions throughout the city that are accepted by citizens. The goal is met if interventions do not put at risk the values of citizens.
2. Gameplay	Collectively, players need to create the buildings on their street by first laying the value-foundations, moving in residents that agree on those foundations, and finally,improving the building with technology. However, residents can decide to move out when they disagree on the technology or new ones can move in that agree on the redesign. A smart building with no residents would be the worst case scenario.	All kinds of citizens live in this city, they all experience city life differently, and prefer different things. Taking turns, citizen-players can mark in the city map the places, currently designed, they feel represented by. The city has challenges to address, for which two parties (anti-tech and pro-tech) have to provide some solutions, on which citizens can vote on. Creating interventions that are rejected by most citizens will not make the city a desirable place to live.
3. Gameworld		
4. Technology	Analogue game with main usage of cards.	Analogue game. Board, drawing pads, cards, and tokens

Appendix E

TDG : final concept

The following tables summarise the brainstorming process for exploring the final design of NewEarth.

REALITY ASPECTS	*Final Concept*
1. Problem	The discussion about urban technologies' design and implementation is happening with a minimum input from citizens, and even less from citizens who have a lesser understanding of smart technology. The discussion is happening with an impactful language barrier.
2. Factors	From TA analysis, the core stakeholders can be identified: policy makers, tech-developers, researchers, citizens, and nature. The built environment and technologies need to be present. Players need to be able to express their values regarding the city and the environment.
3. Relationships	The different stakeholders need to interact and negotiate with each other; these need to allow conflicting views. The conversation during the game should stay away from technical terms and allow players to keep the language within their own understanding.
4. Process	The TD/design process needs to be reflected. The short term decisions need to have a "consequence" further in the process. Environmental transition from the now into the desired future.

MEANING ASPECTS	*Final Concept*
1. Purpose	Discover different perspectives while discussing technology on a levelled knowledge field
2. Strategy	Take the players (and worldviews) through a 'design process' (complete the goal) where they can reframe their solutions (make a strategy) based on what others deem valuable to create (limited resources). Dilemmas will emerge and only through discussing them the process can continue (obstacles). Only by discovering what others want (implicit information), the final result (end goal) will meet individual goals (worldviews). This happens within a fictional setting where players embody different stakeholders.
3. Operations	▪ Explore worldviews -> negotiate through out game ▪ Elicit values -> create roles ▪ Elicit values -> select resources ▪ Negotiate values -> discard resources ▪ Negotiate values -> build new city ▪ In-game goals of fictional scenario ▪ Different combinations to create roles ▪ Mechanic for controlling complexity of language
4. Context	Who? For practitioners involved in smart city collaborations and the societal sphere. Where? In workshops, city labs or participatory sessions

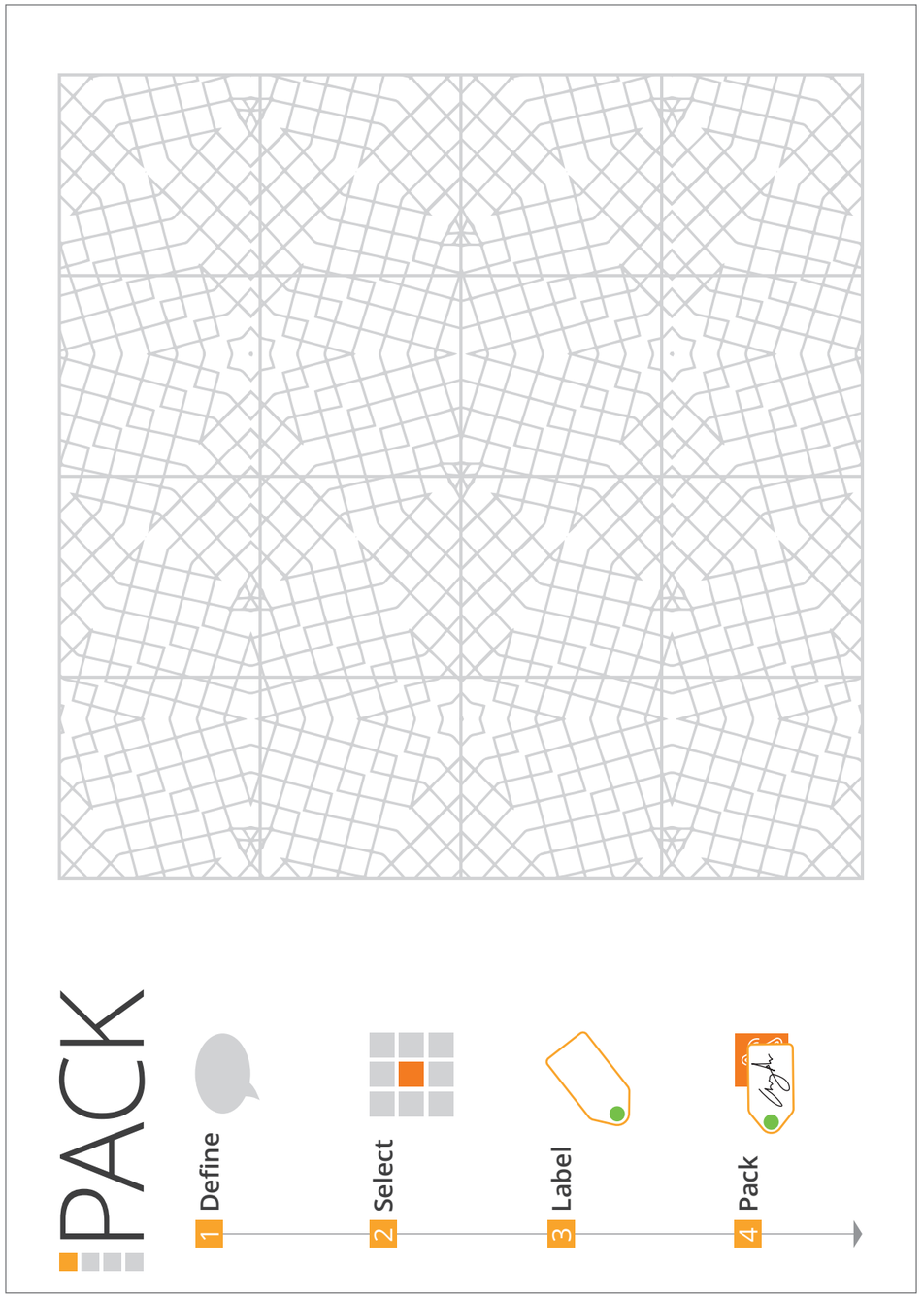
PLAY ASPECTS	*Final Concept*
1. Goal	Negotiation and building game. In-game goal: co-create a city where all players want to live in. The goal is met if the final city created is a place that addresses the city's challenge while creating a desirable place to live in.
2. Gameplay	In a fictional world, players, as their roles, need to complete a series of tasks in order to create a new city where they can explore how certain technologies can benefit them. However, the negotiation will have to remain in everyday language where all roles can engage in the discussion. Moreover, creating a space in this new world can only happen when every player agrees to do so.
3. Gameworld	
4. Technology	Analogue tabletop game. Character sheets, boards, cards, cube tokens.

Appendix F

NewEarth components

The printed materials for the game are shown in the following pages.

Boards

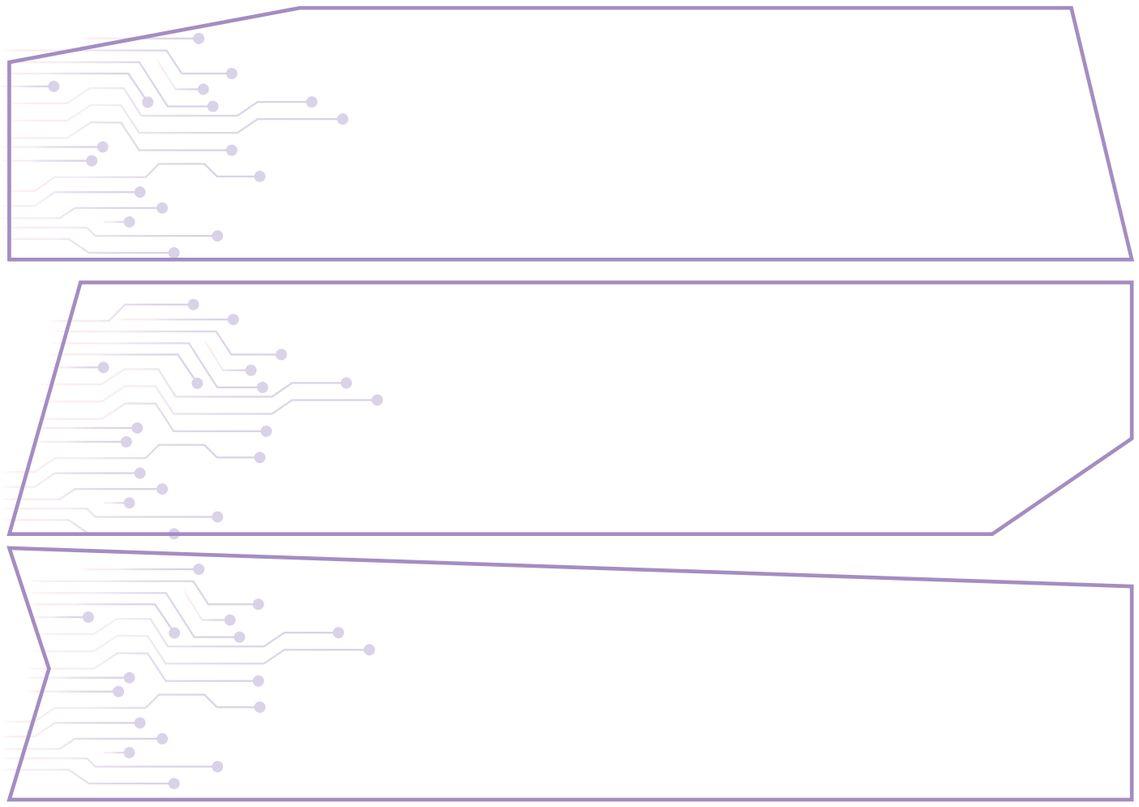


DISCOVER

1 Discover

2 Select

3 Pack



REDUCE

1 Select

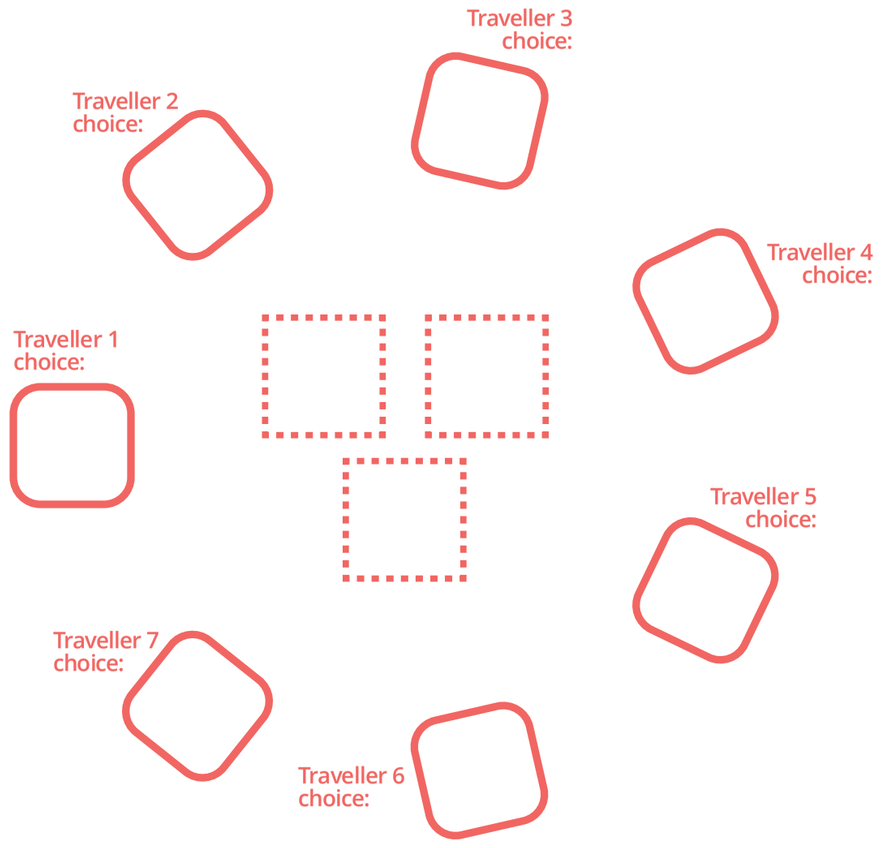
Each traveller chooses 1 resource.

May be yours or from another traveller.

2 Discuss

Only up to 3 resources can come back

3 Re-pack



BUILD

1 **Select resources**

May be yours or from another traveller.

Other travellers must agree to place resources in your build.

2 **Stack your proposal**

3 **Discuss**

Modify or withdraw as needed.

4 **Place & Define tech**

Define tech-resources.

Place according to number of travellers sharing resources.

5 **Next construction**

Until no more resources or no more plans to build.

●●●●●●● Space built by **ALL travellers**	●●●○○○○ Space built by **2+ travellers**	●○○○○○○ Space built by **1 traveller**	●●●●●●● Space built by **ALL travellers**
●○○○○○○ Space built by **1 traveller**	●●●●●●● Space built by **ALL travellers**	●●●○○○○ Space built by **2+ travellers**	●●●○○○○ Space built by **2+ travellers**
●●●●●●● Space built by **ALL travellers**	●●●○○○○ Space built by **2+ travellers**	●●●●●●● Space built by **ALL travellers**	●●●○○○○ Space built by **2+ travellers**
●○○○○○○ Space built by **1 traveller**	●●●●●●● Space built by **ALL travellers**	●●●○○○○ Space built by **2+ travellers**	●●●●●●● Space built by **ALL travellers**

In-game Goals

PACK

Dear future citizens of NewEarth,

We have asked you to come here today to help us prepare for your, and your family's, arrival to NewEarth. We will be doing some renovations in the area you'll be living in and for that we need you to make some design decisions. Since you will be the first ones to arrive you have the responsibility to make the decisions for the rest of the community. Together you will need to pack some things to create a new city, an improved city that fits our **goals**. You don't have to worry about everything, we already have food and clean water available for you. What do you want to bring from Earth that contributes to the new city of NewEarth?

[Read chosen goal]

P.S. Don't forget to label your items accordingly.

DISCOVER

Dear travellers,

First of all, welcome to NewEarth! Hope you enjoyed meeting each other.

Before you continue your journey we would like to show you some of our tools just in case you need them, we call them **tech-resources** and you can use them to achieve your **goal**. We have three different types, you will find the details in the cards. Together decide which ones and how many you want in your future city. You may pack as many as you can fit in the space available.

Further ahead when you start planning your city, discuss how they will work and let us know the details so we can customise them (you may use the **back of the cards**).

Welcome to your new home planet.

*P.S. Remember you may use your **clarify alert** on other travellers whenever the discussion gets too technical or filled with confusing words; just knock with it to alert the speaker they need to change their words.*

REDUCE

Dear travellers,

You are getting closer to the final destination where you will build your new city. However, I'm sorry to inform you that there has been an issue with the shipment and some items have already been lost along the way, apologies for this. Even here technology makes mistakes. Since the cargo still contains too many things, we need you to discard some additional items but it is up to you to decide which ones. We apologise for the inconvenience.

We propose each one of you **selects** one resource from the container that you want to leave behind, whether it is yours or from another traveller. Then continue to **discuss** which of the chosen resources deserve to come back, 3 is the maximum load that we can safely get to the final destination.

Good luck!

P.S. When you settle on which 3 resources to bring back, put them back into the container.

BUILD

Welcome to your own space on NewEarth, your new home!

After such a long trip it is finally time to create a new city that fits your **goal**.
Your shipment arrived safely, we hope you didn't lose anything irreplaceable.

What do you want to build to achieve your goal? What resources do you need?

1. **Select** the needed resources from the container
   a. May be yours or from other travellers
   b. Other travellers must agree to share resources with you
2. **Stack** the resources as you pitch your idea
   a. Tech-resources are not mandatory to be used
3. **Discuss** how your proposal contributes to the goal
   a. Does it need any adjustments? Together modify the proposal
   b. If no agreement is reached, you may withdraw your proposal
4. **Place** your stacked construction accordingly
   a. Fill in the details for the tech-resources
   b. Choose a place on the grid according to how many travellers are putting resources in this construction
   c. Only 1 stacked structure can be built per space on the grid.

Stay open to new ideas!

Goal 1.

Mobility

Mobility and transport are crucial for a city to function properly. The Netherlands is considered the world capital of cycling most of its inhabitants using their bike on daily basis. There has been an increase in electric car owners along with an increase in car sharing. However, this is less than 1% of the total car use and the air quality is not as good as we want it to be.

In NewEarth we not only want to keep this trend but continue to increase it, this calls for innovative mobility solutions that stimulate cities and citizens to explore alternatives to (private) car usage.

How can we create a smart city that allows all inhabitants to move through the city in an environmentally friendly way?

Goal 2.

Energy

The energy transition is both a technical and social challenge. Cities, buildings and households are in need of clean energy for electricity, heating and cooling. One of the social challenges is the adjustment or change that needs to be made by citizens in their life style. This may require some sacrifices but the benefit would be for everyone and future generations.

In NewEarth we are looking for interventions at household, building, neighbourhood, community, or city level that help inhabitants keep their energy consumption at the lowest possible.

How can we create a smart city that helps and promotes its inhabitants consume less energy in their daily lives?

Goal 3.

Climate

For many cities, extremely hot and dry weather has resulted in dying plants and grass, declined water quality, malfunctioning bridges, weakened housing foundations and cracked cycle paths and roads. The extreme temperatures not only affected the environment, but also human health and well-being, especially of elderly people and young children. In urban areas the heat generated by people, vehicles and the sun is easily trapped by the materials used to build the city.

In NewEarth we want to prevent extreme weather conditions and compensate any possible impact made to the natural environment by our settlement.

How can we create a smart city that takes care of natural resources and has a lower polluting impact?

I think nature can be harsh and unpredictable, but humans can control it.	*I think nature is adaptable, so it will recover from the damage caused by humans.*	*I think nature is fragile and in a delicate balance, easily destroyed by humans.*	*I think nature is so complex than it cannot be captured in a single perspective.*
I want a city that allows citizens to have a simple and humble lifestyle.	*I want a city that allows citizens to have a comfortable and fun lifestyle.*	*I want a city that allows citizens to have a diverse and expressive lifestyle.*	*I want a city that allows citizens to have a more wholesome and natural lifestyle.*
I believe nature is created by a god and therefore it is valuable.	*I believe nature's worth is that humans can use it and enjoy it.*	*I believe all perspectives on nature are important.*	*I believe nature is valuable even if it isn't for humans benefit.*
I am proud of my religious upbringing.	*I consider my social position and/or achievements to define me.*	*I consider myself to be a citizen of the world.*	*I see myself as connected to the grandness of the universe.*
Everybody needs to sacrifice their own desires to serve the community.	*Everybody needs to stand up for oneself.*	*Everyone should be taken care of in the community.*	*Everybody can work for a better world when they can prosper in life.*

RESEARCHER

About me

I am a proud member of the scientific community. I conduct research in the Netherlands with funds from the European Commission and collaborate with other cities to create a better Europe. We are working towards creating sustainable cities, neighbourhoods and houses where we sometimes invite citizens to help us.

My future city

We are working to create new 'smart' cities, transform how the city operates while citizens can still feel comfortable living here. This would involve some lifestyle adjustments since the change will be beneficial residents of the city but will require some sacrifices. I see some people get scared when talking about this transformation so usually some explaining is needed.

Clarity Alert

Use it to knock on the table whenever a traveller uses technical terms that your role is not familiar with or outside your expertise.

If you receive the alert, modify the language you are using to be understandable for all before carrying out with your argument.

I may be heard saying...

Place card here

Place card here

Place card here

Place card here

Place card here

Introduce yourself to fellow travellers

Create a name for your role and write a brief introduction about your relationship to the city and information from the previous page.

What is _____'s vision for the new city?

Write your answer after reading the goal.

CEO TECH-STARTUP

About me

As the CEO of my startup, I have led my team of employees to create products that solve some of the city's problems using new technologies. I am proud of staying up to date with the latest trends around Europe and bringing them to the Netherlands because the market is very competitive so I am always looking for new opportunities.

My future city

Some residents and politicians believe my products can solve any kind of problem almost like magic. Others refuse having my products installed in the city, there has even been protests against them. EU policy for this market is sometimes confusing on what I can and cannot do, for now it is unexplored terrain. I only want to keep my business running and innovating.

Clarity Alert

Use it to knock on the table whenever a traveller uses technical terms that your role is not familiar with or outside your expertise.

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I may be heard saying...

Place card here

Place card here

Place card here

Place card here

Place card here

Introduce yourself to fellow travellers

Create a name for your role and write a brief introduction about your relationship to the city and information from the previous page.

What is _____'s vision for the new city?

Write your answer after reading the goal.

CITIZEN

About me

As a local resident I spend my days attending my daily activities and hobbies, I have seen my neighbourhood and neighbours change over the past years. Sometimes I even consider moving to a different place; here the roads are getting more crowded, the weather is not as nice as it used to be and energy is getting expensive.

My future city

I keep hearing some weird terms on the news about a 'smart city' and projects that are being funded, some 'experiments' on new technologies that promise to make the city and my life better. I don't have the time to find out how it works, nor that I would understand all those complex words; but I am still worried of what will change.

Clarity Alert

Use it to knock on the table whenever a traveller uses technical terms that your role is not familiar with or outside your expertise.

If you receive the alert, modify the language you are using to be understandable for all before carrying out with your argument.

I may be heard saying...

Place card here

Place card here

Place card here

Place card here

Place card here

Introduce yourself to fellow travellers

Create a name for your role and write a brief introduction about your relationship to the city and information from the previous page.

What is _____'s vision for the new city?

Write your answer after reading the goal.

ALDERMAN OF URBAN PLANNING

About me

As Alderman I am in charge of developing policy that promotes the citizens' interests and advocating for the issues my party deems of higher priority. Part of my job involves talking with local residents, business owners and other organisations that might be affected by the technologies we want to implement.

My future city

The cities in the area have more cars, get less rain, longer heatwaves, barely any snow and rising energy costs, my party promised to work on this. Solutions are needed that will remain useful in the long term, solutions that are innovative but that do not start any protest or scandal.

Clarity Alert

Use it to knock on the table whenever a traveller uses technical terms that your role is not familiar with or outside your expertise.

If you receive the alert, modify the language you are using to be understandable for all before carrying out with your argument.

I may be heard saying...

Place card here

Place card here

Place card here

Place card here

Place card here

Introduce yourself to fellow travellers

Create a name for your role and write a brief introduction about your relationship to the city and information from the previous page.

What is _____'s vision for the new city?

Write your answer after reading the goal.

NATURE

About me

As the original resident of this land, I have seen many cities being born and growing to merge with each other. I see humans taking more and more resources as my health deteriorates, I have tried telling them I am unwell but only some pay attention. Those who listen try to take care of me but it is not enough to compensate for the past decades.

My future city

My health issues are becoming more and more evident, somewhat unpredictable. Lately through some technologies humans are trying to understand how they can help me recover, but more importantly how they can survive. If they don't learn from their past soon enough, their future well being and mine will be compromised.

Clarity Alert

Use it to knock on the table whenever a traveller uses technical terms that your role is not familiar with or outside your expertise.

If you receive the alert, modify the language you are using to be understandable for all before carrying out with your argument.

I may be heard saying...

Place card here

Place card here

Place card here

Place card here

Place card here

Introduce yourself to fellow travellers

Create a name for your role and write a brief introduction about your relationship to the city and information from the previous page.

What is _____'s vision for the new city?

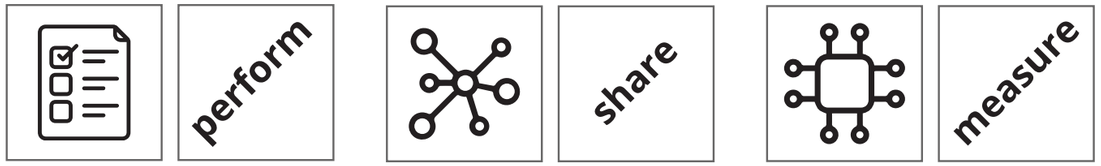
Write your answer after reading the goal.

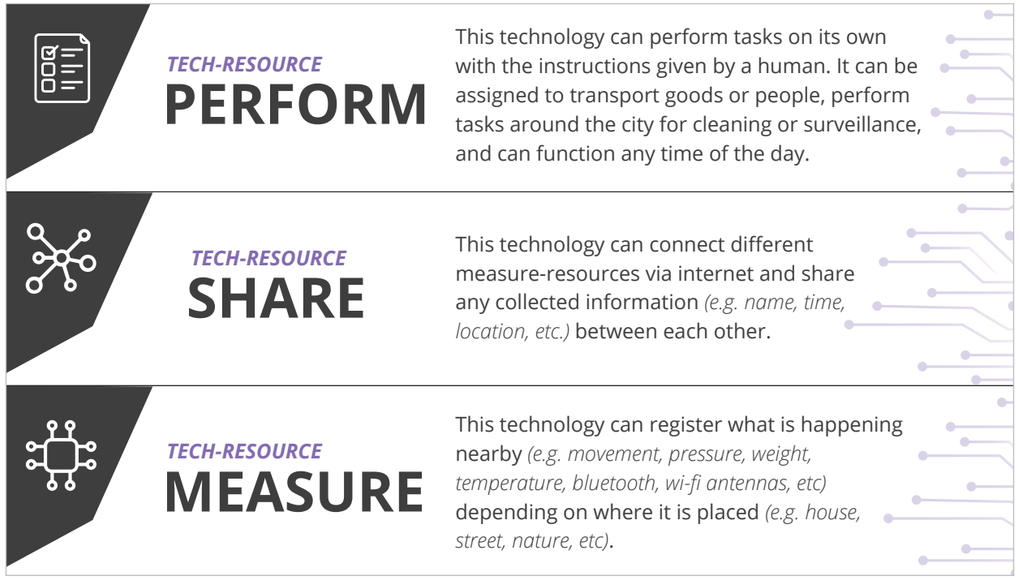
Resource Container

Traveller 1						
Traveller 2						
Traveller 3						
Traveller 4						
Traveller 5						
Traveller 6						
Traveller 7						

Earth Resources

Tech-resources





TECH-RESOURCE

PERFORM

This technology can perform tasks on its own with the instructions given by a human. It can be assigned to transport goods or people, perform tasks around the city for cleaning or surveillance, and can function any time of the day.

TECH-RESOURCE

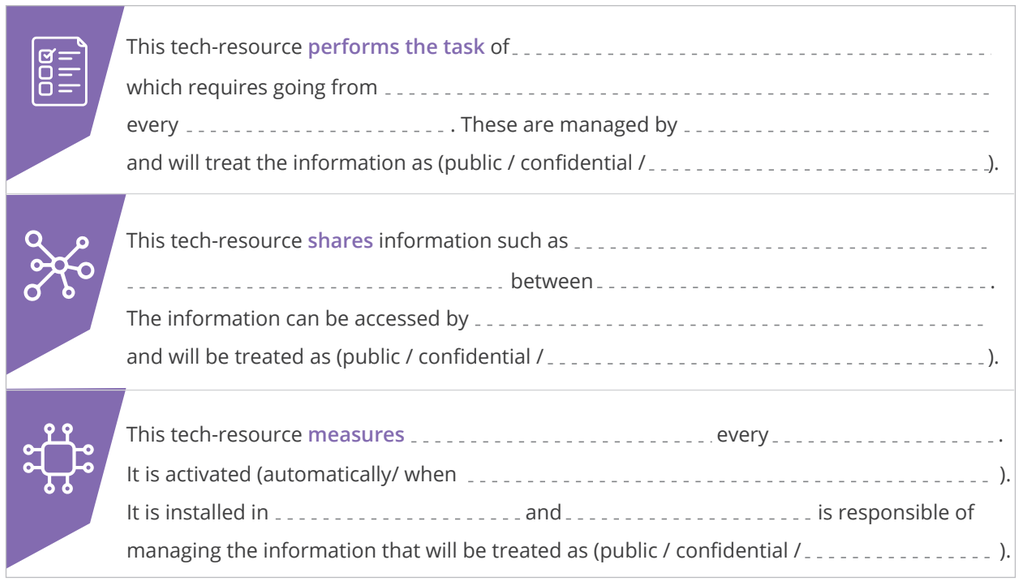
SHARE

This technology can connect different measure-resources via internet and share any collected information *(e.g. name, time, location, etc.)* between each other.

TECH-RESOURCE

MEASURE

This technology can register what is happening nearby *(e.g. movement, pressure, weight, temperature, bluetooth, wi-fi antennas, etc)* depending on where it is placed *(e.g. house, street, nature, etc)*.



This tech-resource **performs the task** of _____
which requires going from _____
every _____. These are managed by _____
and will treat the information as (public / confidential / _____).

This tech-resource **shares** information such as _____
_____ between _____.
The information can be accessed by _____
and will be treated as (public / confidential / _____).

This tech-resource **measures** _____ every _____.
It is activated (automatically/ when _____).
It is installed in _____ and _____ is responsible of
managing the information that will be treated as (public / confidential / _____).

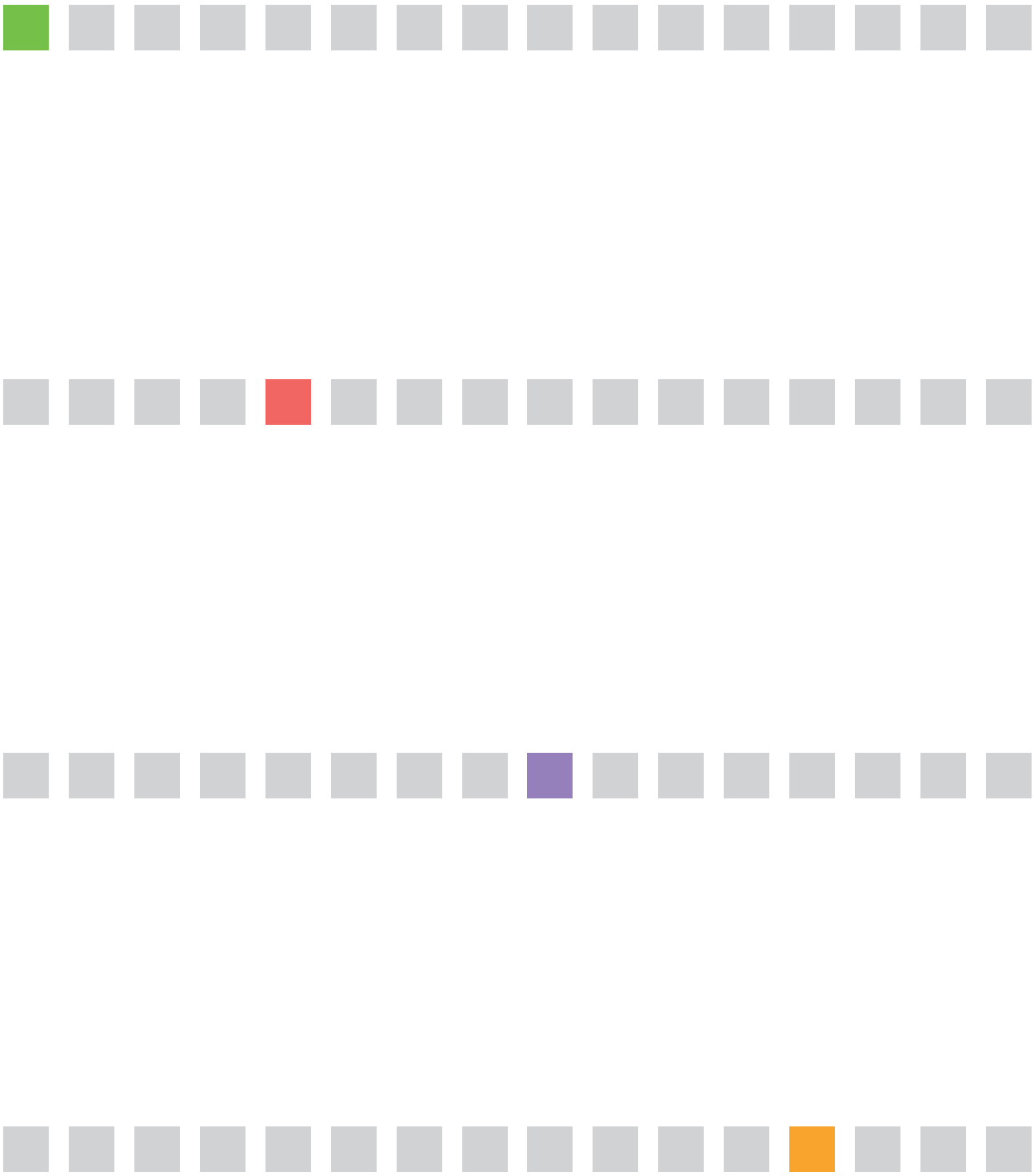
Voting ballot

No

Because... _____

Yes

Because... _____



Valuables of NewEarth:
From reality to games and the way back