EXPLORING THE USE OF A 3D VISUALISATION TOOL FOR PARTICIPATORY PLANNING

A Case Study of UrbanistAI in a Northern European City Government

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Abstract

Participatory planning continues to provoke debate amongst practitioners and academics alike, with digital tools adding complexity to the field. This thesis explores the use of a digital tool for participatory planning, focusing on the Pilot Phase of UrbanistAI within a Northern European city government. Using a case study approach, the research investigates the challenges a municipality faces when adopting a digital participatory tool, more specifically a 3D visualisation tool using text-to-image technology to support public participation in urban planning processes. Drawing on Communicative Planning Theory and Post-Actor-Network Theory, particularly the concepts of Ontological Multiplicity and Fluid Technology, the study aims to provide a nuanced understanding of how digital tools, like UrbanistAI, interact within diverse stakeholder engagements. The empirical data is based on semi-structured interviews, participant observations, and document analysis. The resulting analysis on the tool's ontologies - a visualisation tool for communication, and a commercial digital tool - highlights the benefits of the tool's fluidity for practising CPT principles. However, the high adaptability of the tool creates a risk for unpredictable outcomes, therefore an approach to 'confine' fluidity was proposed for practitioners' to make agreements to ensure more expected outcomes. Furthermore, the findings show that practitioners' tendency to view the tools as experimental leads to a lack of accumulated knowledge across departments for using digital participatory tools efficiently. The study contributes by offering practical insights for the city government to inform their decision-making and creating a shared space for reflections among the practitioners. A key contribution of the research is the examination of a 3D visualisation tool that uses text-to-image technology in a real-life workshop setting. The study also adds to the broader discourse on the role of digital tools in participatory planning with a techno-anthropological lens.

Keywords: participatory urban planning; communicative planning theory; ontological multiplicity; fluid technology; UrbanistAI; 3D visualisation tool; digital participatory tool; text-to-image technology

Preface

Throughout our techno-anthropology studies, we have been intrigued by the opportunity to integrate our backgrounds in urban planning with researching the emerging digital tools in this field.

Our thesis builds upon a previous semester project in which we facilitated two workshops that brought together citizens and architects to collaboratively re-imagine spatial solutions using a text-to-image tool Midjourney. During the project, we established contact with UrbanistAI for an expert interview, which evolved into an internship for both of the authors in the following semester. In the internship, we examined three use cases to understand the key barriers and enablers of using UrbanistAI in workshops. In this thesis, we delve further into the use of UrbanistAI in a Northern European capital to investigate what happens when a municipality tries to adopt this tool into its practices.

Throughout our research, numerous stakeholders and supervisors have provided valuable insights and guidance. We extend our gratitude to the city government for allowing us to engage with city officials across many departments. Special thanks go to the team at UrbanistAI, especially our main contact person and co-founder, for his support during our internship and his willingness to share his many observations, even through some of the busiest times for the company. We are also grateful to our previous supervisor, Kristian Holst Kristiansen, who encouraged us to present our eight-semester project at the Masshine conference, *Generative Methods - AI as a Collaborator and Companion in the Social Sciences and Humanities*. This presentation sparked the motivation to continue exploring this topic. Finally, we are deeply thankful to our thesis supervisor, Wendy Gunn, for her guidance and support throughout our thesis work.

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CHAPTER 1

1.1 Introduction

> *Neither a 'good thing' per se nor any particular kind of problem, participation is instead always situated in a field of tensions and possibilities that must be carefully navigated.*
>
> *(Brownill & Inch, 2019, p. 2)*

The thesis finds its point of departure in this quote, which expresses very well how participation in planning practices has been since 1969[1] and still is something deserving of careful attention. An attention we, through our investigation, aim to give while still being aware that studying the field of participatory urban planning will most likely not yield any clear-cut answers. Since the seminal discussions in the late 60s, participation has been continuously framed as a response to the 'wicked' problems of urban planning - a concept coined by Horst Rittel and Melvin Webber in 1973. These problems are not just complex; they are characterised by their resistance to straightforward, permanent solutions, demanding adaptive and comprehensive approaches to urban planning (Rittel & Webber, 1973). The continuing challenges within the field of participatory planning have triggered scholars and practitioners to continually develop and refine theories and methods that address the dynamic, multifaceted nature of these problems (Brownill & Inch, 2019).

It is within this context that Communicative Planning Theory (CPT) emerges as an important framework. Since the 1980s, CPT has increasingly focused on the need to expand citizen participation in urban planning, advocating that such expansion enhances urban spaces through improved decision quality, increased social cohesion, and greater legitimacy and acceptance of urban design projects (Healey, 2003; Niitamo, 2021). CPT scholars argue that to effectively tackle the 'wicked' problems identified by Rittel and Webber (1973), planning processes must incorporate consensus-building through deliberate and dialogue-oriented approaches at all stages (Healey, 2012). Despite these efforts, the challenges of participatory urban planning persist, illustrating the ongoing relevance and necessity of adapting and refining participatory approaches within the evolving urban context (Brownill & Inch, 2019).

To further increase the level of complexity in participatory urban planning, the introduction of new digital tools[2] by both public and private stakeholders marks a significant shift and has

[1] The year of the publication of the influential works for participatory planning, 'People & Planning' and 'A Ladder of Citizen Participation', from the Skeffington Committee and Sherry Arnstein respectively.
[2] Examples from Northern European cities are the Avalinn AR, The GreenTwin, Maptionnaire and UrbanistAI - UrbanistAI is the digital tool of interest in this investigation.

added yet a new layer to consider when approaching the field (Barry & Legacy, 2023). The intertwining of participatory planning and technology requires addressing socio-technical systems[3]. Given that CPT is not a technology-focused framework and lacks the necessary vocabulary to analyse the issues arising from this intersection, we look to Science and Technology Studies (STS) for a better fitting conceptualisation. Before we introduce our approach any further, we want to introduce the chosen case for our study[4].

1.1.1 Problem Area and Research Questions

A city government of a Northern European capital has the possibility of using UrbanistAI (UAI), a 3D visualisation tool for participatory planning[5]. UAI is a web app that utilises artificial intelligence (AI) to transform textual input into images of locally situated scenarios, enabling real-time interactions and modifications by stakeholders, usually during in-person participatory planning workshops (UrbanistAI, n.d.). Following an initial street redesign workshop (from now on called the Street Redesign Workshop) in the city in August 2023 using UAI, a licence to the tool was purchased for the practitioners in the city government, to be used in a 6-month Pilot Phase ending in June 2024. In the first five months of the Pilot Phase, UAI has been used in a few workshops, but as we are closing in on the end of the licence period, the city now has to decide whether or not to extend its licence. Knowing how participatory urban planning is a field full of complexity, which has only increased with the introduction of new digital tools, this decision is not an easy task. This is also why the case of UAI in this Northern European city government serves as a compelling case study for techno-anthropologists.

The connection between UAI - the issues the tool's developers have tried to address - and CPT, is how they both focus on promoting dialogue and consensus-building in the planning process to enhance urban spaces. For the UAI developers, the introduction of the tool, and thereby the generation of images, has the potential to ensure easier communication between different stakeholders. As stated, CPT does not allow for a deep investigation into socio-technical systems, which is why we look to STS to bring out important nuances when exploring the integration of UAI in the city government. We use the concepts of Ontological

[3] This is the understanding of technologies prominent to techno-anthropology (Botin & Børsen, 2021)
[4] To ensure the anonymity of our informants, we are not disclosing the exact capital in question. We follow the definition of Northern Europe as per the UN's Geoscheme division of the European continent (UNSD, n.d.)
[5] We use the definition from Eilola et. al (2023), which will be unfolded in the literature review.

Multiplicity and Fluid Technology. By understanding realities as multiple, STS scholars Annemarie Mol, John Law and Jonas Bylund contribute to this discussion through the conceptualisation of urban environments as being dynamic and fluid[6] (Bylund, 2013; Law, 2002; Law & Mol, 2001; Mol, 2002; Mol & Law, 1994). Furthermore, it is claimed that in such environments, it would be equally suitable to conceptualise the technologies as fluid, meaning the technologies can adapt based on local, situational needs (Bylund, 2013; de Laet & Mol, 2000; Law, 2002). Bylund (2013) additionally highlights that technologies that are conceptualised as having fixed boundaries, might struggle to succeed in fluid spaces and end up breaking[7].

Through our empirical data, this case allows us to tell the story of the complexities in navigating participatory urban planning within a fluid urban practice in a Northern European city government. The Pilot Phase of UAI in the city government's participatory planning activities aims to highlight the potentials and challenges of adopting 3D visualisation tools for communicative urban planning to enhance participatory practices. Consequently, our goal is to contribute to the assessment of the Pilot Phase. We will share our findings with the practitioners over an online meeting and create a space for dialogue and mutual learning across multiple departments in the city government and the UAI team.

Through the lenses of CPT, Ontological Multiplicity and Fluid Technology, this thesis explores the Pilot Phase of UAI in the city government in a retrospective way. With the following research- and sub-questions, we attempt to build a deeper understanding of the UAI use in a Northern European city government:

How can the Pilot Phase of UrbanistAI in a Northern European city government help understand the challenges of adopting 3D visualisation tools for participatory planning in municipalities?

How are the challenges of participatory planning addressed with UrbanistAI?

How might the conceptualisation of UrbanistAI as a fluid technology provide insights to inform decision-making?

[6] Urban environments can according to Law & Mol (1994), Law (2001) and Bylund (2013) also be understood as euclidean, network and fire spaces.
[7] 'Breaking' is to be understood in a figurative sense.

1.1.2 Scope and Delimitations

In defining the scope of this thesis, it is essential to clarify certain aspects regarding our focus. The UAI tool uses AI, more specifically text-to-image technology (UrbanistAI, n.d.), a topic currently receiving considerable attention in research. Our study explores the added capabilities of UAI as a generative AI application from a 3D visualisation tool perspective. However we are not focused on the broader implications of using generative AI.

This distinction is important because, while AI-enabled features of UAI are inherently significant, our research is guided by the empirical data which highlights the platform's role in supporting communicative aspects of participatory planning rather than the intricacies of an AI technology. The potential misinterpretations arising from the "AI" component in the name “UrbanistAI” might suggest a technologically focused analysis, whereas our study aims to explore the implications of integrating 3D visualisation tools in participatory urban planning processes.

Our literature review reveals a significant gap concerning the practical applications of 3D visualisation tools in real-life urban planning settings. Most existing research tends to focus on theoretical possibilities or controlled environment simulations (Eilola et al., 2023), leaving a void in the understanding of these tools in actual municipal practices. By focusing on UAI’s application within a Northern European city government, this study addresses this gap, offering new insights into the challenges and potentials of applying 3D visualisation tools in participatory planning.

Furthermore, the introduction of such digital tools in municipal participatory planning is still a relatively new and under-explored area, demanding a focused study to understand its impact thoroughly (Eilola et al., 2023). While we acknowledge the importance of AI ethics and the broader implications of generative AI technologies, these areas, though related, fall outside the primary scope of this thesis. We encourage future research to explore these dimensions, particularly how AI ethics can intersect with and influence participatory urban planning practices. Such studies would complement our findings and potentially broaden the understanding of digital participatory tools.

By setting these boundaries, we aim to provide a focused exploration of UAI from a techno-anthropological perspective, emphasising its role as a 3D visualisation tool in supporting participatory urban planning.

CHAPTER 2

Chapter 2 takes the reader through a literature review, introduces the case context and ends with bringing out the research angle by detailing the scope of the study and contributions.

2.1 Literature Review

Through the literature review, we explore the emergence of participatory planning, the evolution of communicative planning principles, and the potential benefits of public engagement. We also discuss the contradictory nature of participation and the challenges in implementing communicative planning practices. We introduce digital tools for participatory planning, particularly 3D visualisation tools, providing an overview of their characteristics, and the new directions with the emergence of text-to-image technologies. Finally, the review addresses the challenges in developing and adopting digital participatory planning tools and highlights the research-practice gap.

2.1.1 Participatory Planning

Public engagement has been a topic of discussion since the 1960s, with a trend towards increased transparency and broader public involvement in the planning process across Europe (Nadin et al., 2021). In this context, participation refers to municipalities engaging with the public to inform them or to gather input on urban planning projects. Yet, as we will discuss later in this section, even defining what constitutes participation is not an easy task (Hofer & Kaufmann, 2023). Participatory planning is believed to support addressing increasingly complex challenges by using stakeholder knowledge to inform decision-making and additionally promote 'good governance' by facilitating public involvement in creating a more just city (Nadin et al., 2021). However, there is continuous scepticism about whether the potential benefits of participatory planning can truly deliver on its promises (Nadin et al., 2021). The dissonance between the ideals of participation and its actual implementation in practice is evident, and so is public participation underpinned by tensions (Carpenter & Brownill, 2008; Forester, 2006; as cited in Nadin et al., 2021). To better understand the dynamics and contradictory nature of participation, we will begin by giving an overview of its emergence and evolution.

Emergence of Participatory Planning

The roots of participatory planning lie in the 1960s and '70s, a time of political and social activism in the United States and Europe, when the public began taking a more active role in civic matters (Robertson & Simonsen, 2012). There was a growing interest in developing more participatory forms of democracy, which sparked new ideas and a demand for more public participation (Brownill & Inch, 2019). This era coincided with postwar urban renewal projects, often characterised by a modernist approach, where planners designed cities based on idealised visions of social engineering rather than the actual needs of communities (Fainstein & Campbell, 2016).

Two prominent figures within planning studies, Jane Jacobs and Sherry Arnstein, heavily criticised urban redevelopment projects for ignoring local needs (Arnstein, 1969; Jacobs, 1961). Jacobs (1961) advocated for citizen-driven decision-making processes that valued local knowledge, social interactions, and the human scale of urban environments. Sherry Arnstein (1969), in her "A Ladder of Citizen Participation", proposed a conceptual framework for varying degrees of engagement dividing participation into three groups: non-participation, tokenism and citizen power - as shown in Figure 1. The framework brings out that there is a crucial difference between merely going through the motions of participation and having the genuine power necessary to influence the outcome of the process, therefore highlighting that participation could take varied, even contradictory forms when mobilised for different purposes (Brownill & Inch, 2019). We will introduce the rungs of Arnstein's Ladder, as this framework is used to evaluate participation modes to this day (*International Association for Public Participation*, n.d.; Nadin et al., 2021).

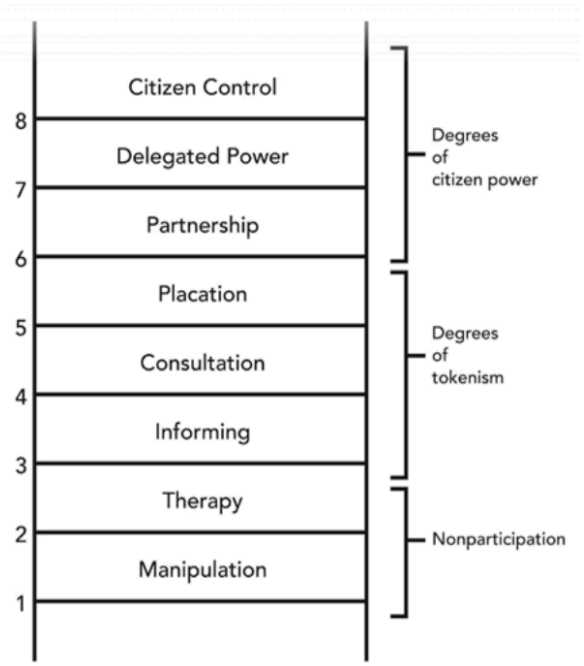


Figure 1, Ladder of Citizen Participation (Arnstein, 1969, p. 217)

At the bottom of the ladder, we find manipulation and therapy where the goal, according to Arnstein, is not participation, but to "enable powerholders to "educate" or "cure" the participants" (Arnstein, 1969, p. 217). Moving up the ladder to tokenism, which includes informing, consultation and placation, Arnstein finds that while citizens may have the opportunity to voice their opinions, she criticises the lack of power to ensure citizens' perspectives will be taken into account by those in positions of authority (Arnstein, 1969). At the top of the ladder sits partnership, delegated power and citizen control in which citizens share decision-making authority with public officials either by having seats at the policy boards or having full control, for example by being organised into neighbourhood corporations. What stands out is Arnstein's emphasis on the inadequacy of anything less than citizen control, which she firmly believes should be the ultimate goal (Arnstein, 1969).

Communicative Planning Approach

Arnstein's (1969) and Jacobs's (1961) contributions played influential roles in shaping the transition towards more participatory urban planning practices in the US and Europe, paving the way for further advancements in this approach in the following decades. In "Planning as Social Learning", Friedmann (1981) introduced transactive planning, framing planning as a mutual learning process involving stakeholder dialogue (Friedmann, 1981). Building on this,

Communicative Planning Theory (CPT) emerged, with John Forester, Patsy Healey and Tore Sager as the main contributors, emphasising the importance of communication in planning, focusing on consensus-building, inclusivity, and diverse perspectives (Forester, 1999; Healey, 2012; Sager, 2017). CPT scholars view planning as a communicative act aimed at creating shared understanding and meaningful engagement among stakeholders (Healey, 2012), which is further defined by Sager (2017):

> *Communicative planning (CP) is seen here as a participatory and dialogical endeavour involving a broad range of stakeholders and affected groups in socially oriented and fairness-seeking developments of land, infrastructure, or public services. (p. 93)*

While consensus-building, mutual learning and inclusivity are common principles in many forms of stakeholder engagement, what sets CPT apart is its emphasis on achieving outcomes through continuous dialogue throughout the entire planning process of an urban planning initiative (Healey, 2012; Sager, 2017). Not surprisingly, the planner's role shifts significantly from that of a technical expert to a facilitator and mediator. According to Tore Sager (2017), planners are now responsible for creating spaces that encourage dialogue, collaboration, and the integration of diverse voices into decision-making. This approach contrasts sharply with the top-down, modernist approach of planners in post-war Europe and the United States (Sager, 2017).

Contradictory Nature of Participatory Planning

Communicative Planning principles are widely accepted among urban planning practitioners across Europe, and shifts in state-society relations over the past decades have further promoted public engagement (Lane, 2005; Nadin et al., 2021). An illustrative example of recognising participation as important is the United Nations' emphasis on participatory urban planning as a key principle for achieving more sustainable and livable cities (*#Envision2030 Goal 11: Sustainable Cities And Communities | Division for Inclusive Social Development (DISD)*, n.d.). Also, both Arnstein and Jacobs still have a prominent impact. Arnstein's influence is evident in contemporary frameworks that promote or evaluate public participation. For example, a recent study examining whether the governments in Europe are increasing citizen engagement in spatial planning based on the evaluation of Arnstein's ideas as well as including more recent understandings (Nadin et al., 2021). Similarly, the

International Association for Public Participation (IAP2) has developed the framework "Spectrum for Public Participation" that closely resembles Arnstein's ladder and ultimately encourages the empowerment of citizens - see Figure 2.

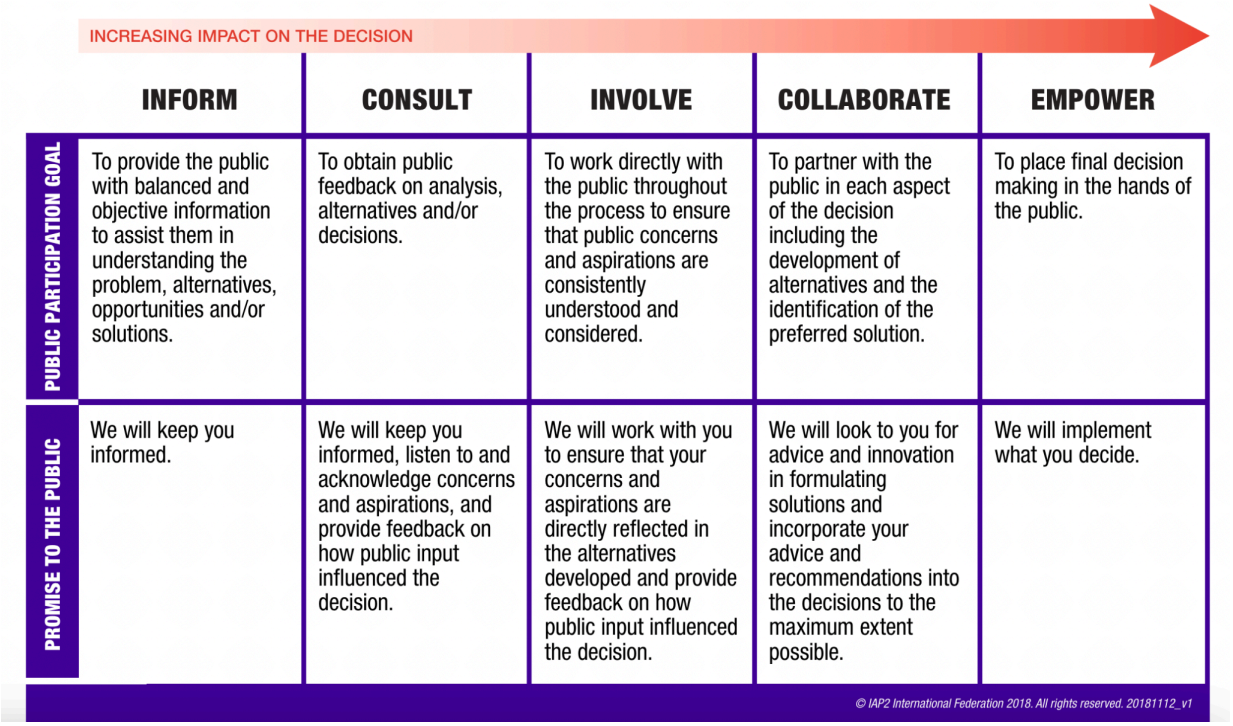


Figure 2, Spectrum for Public Participation (IAP2, n.d.)

Furthermore, public participation is not only a mandatory aspect of urban planning in most European countries but is also often encouraged in planning stages where it is not legally required. Therefore, there is an increase in novel and more experimental ways of interactions between the public and the municipality compared to traditional formal hearings (Nyseth et al., 2019). Also, public participation efforts increasingly promote inclusivity and diversity to ensure the voices of minorities are heard, which is also reflected in the shift from using the narrower term of "citizen participation" to the broader "public participation" (Slotterback & Lauria, 2019).

Despite the continuous promotion and advocacy for public participation, both academic and public discourse often frame participation as a persistent 'problem' in various ways. Brownill and Inch (2019) highlight this issue well:

> *How many times since have we heard that a new initiative would result in 'real' or 'meaningful' participation without consideration of what that would really entail, how we would know when it had been achieved or whether the public would get their voices heard as a result? (p. 5)*

Defining what is meant by participation is tricky because it is rarely explicitly defined; it remains abstract and encompasses a variety of meanings and forms (Hofer & Kaufmann, 2023). Arnstein (1969) defined citizen participation as the "redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future" (p. 216). However, currently, the term participation is often used to describe almost every interaction with individuals or groups in planning (Alfasi, 2021; as cited in Hofer & Kaufmann, 2023). Terms such as participation, engagement, co-creation, collaboration, consultation, and deliberation are frequently used interchangeably and the methods vary from traditional town hall meetings to interactive co-design workshops. An all-inclusive approach to defining participation is also noticeable in the IAP2 framework. Where Arnstein ridiculed the lower rungs of the ladder as non-participation, the IAP2 framework frames "informing" and "consulting" as an accepted approach within the spectrum of participation (IAP2, n.d.). Furthermore, Tritter and McCallum (2006) argue that focusing only on power dynamics in participation overlooks the importance of different forms of knowledge and, as Alfasi (2021) points out, planners' engaging with people - either the public or experts - is a necessary part of the planning process, sometimes solely for the purpose of gathering information, and therefore should not be labelled as 'participation' (Hofer & Kaufmann, 2023). To clarify, we will throughout the thesis use the terms "participation", "engagement", and "involvement" interchangeably, to indicate any kind of interaction between municipalities and the public.

For conceptualising participation, we are inspired by Garau's (2012) perspective, viewing participation as "*emergent and thus never completely definable ex-ante*" (Garau, 2012; as cited in Hofer & Kaufmann, 2023). This perspective leads to viewing participation as a phenomenon that does not pre-exist but is continuously formed and shaped through its various dimensions (Hofer & Kaufmann, 2023). Hofer & Kaufmann (2023) build on this notion further by describing participation as a "*fluid and emergent phenomenon*" (p. 358) and emphasise the importance of reflecting on the interactions and interdependencies between its different elements. The focus shifts from evaluating, ranking, or classifying certain forms of

participation to providing a conceptualisation for a better understanding of what shapes the phenomenon (Hofer & Kaufmann, 2023). This viewpoint also forms the foundation for how we approach participation in our study.

It is also argued that keeping the concept of public participation vague and undefined allows for it to be controlled and manoeuvred (Alfasi, 2021). Unsurprisingly, when participation is framed as merely any kind of interaction, it becomes unclear what role the public should play and what the expected outcomes are. Arnstein's goal of citizen control is frequently upheld as an ideal or dismissed as impractical for local decision-making contexts (Slotterback & Lauria, 2019). While CPT envisions public participation throughout the entire process of an urban development project, then it is questioned whether the ideals of communicative planning could ever be achieved in real-life settings, and if CPT solely offers a view of "*what participation should do rather than a realistic assessment of what actually happens in practice*" (Brownill & Inch, 2019, p. 10). Furthermore, it is said that the communicative approach is power-blind (Allmendinger & Tewdwr-Jones, 1998; Flyvbjerg, 1998; Yiftachel, 1995), not taking into account the power imbalance between the public and the planners inherent in a planning practice.

What is more, planning is increasingly challenged by pressing sustainability issues such as rapid urbanisation, housing shortages, climate change, and socio-economic problems (E. Falleth et al., 2010; E. Falleth & Saglie, 2011; Mäntysalo et al., 2015; as cited in Calderon et al., 2024) and at the same time, the influence of neoliberal ideas have led to strong demands to 'speed up' and increase the efficiency of planning processes (Calderon et al., 2024). Yet including participatory activities before or alongside the legally required consultation period implies a more time-consuming planning process (Innes, 2004; as cited in Calderon et al., 2024; Sager, 2009). Therefore, it has been argued that there is a dual pressure for swift and slow planning, which is perceived as an 'either-or' tension. Decision-making processes are said to be either swift yet exclusive and technical-based and/or market-driven, or, on the contrary, participatory and deliberative but slow (Calderon et al., 2024).

Some critics also argue that CPT principles have been exploited to win the public's approval to ensure a faster process that serves the neoliberal interests of the municipalities, often with limited and narrowly defined forms of public inclusion (Brownill & Inch, 2019). We appreciate a more nuanced view from Calderon et. al (2024) whose recent study on Nordic

planners concludes that the practitioners acknowledge the contradicting demands of the double pressure of swift and slow, finding both legitimate and balancing between them based on the planner's best judgement. Viewing the pressure to quicken the process solely as a neoliberal trap may overlook nuances, though it is crucial to consider its potential impact. Calderon et al. (2024) argue that it would be more helpful to move the focus away from either promoting or questioning the normative ideals of communicative planning theory, but propose moving towards an acknowledgement of planners' adeptness in balancing conflicting demands, making use of 'pragmatic exclusion' to decide which issues to discuss, and which outcomes are pursued.

The debates among planning theorists regarding the impact of participation on public participation and the varied levels of influence, acknowledged by Arnstein, persist (Brownill & Inch, 2019). While it would be possible to continue listing the issues apparent in participatory planning, that would be too extensive, and, therefore, we hope the main tensions we have outlined here illustrate the complex nature of the arena we are stepping into. Given that planning is coined a 'wicked' problem that does not have definitive solutions but challenges being solved over and over again (Rittel & Webber, 1973), then perhaps it should not be a surprise that involving the public in it, may also be one. Brownill and Inch (2019) argue that rather than viewing participation as either wholly beneficial or problematic, it is crucial to acknowledge its contradictory nature and the inherent ambiguities it presents.

> *Given this, it is vital to explore the messiness of actually existing forms of participation as they emerge, develop and are enacted on the ground, drawing out the implications and possibilities presented by shifting configurations of state-society relations, approaches to governance, planning ideologies and personal testimonies that lie behind the diversity of participatory experiences. (Brownill & Inch, 2019, p. 21)*

The importance of embracing the contradictions within participatory planning acts as a guiding principle for our research angle, which we will expand on later in the chapter.

So far, we have provided an overview of the emergence and evolution of participatory planning and the numerous tensions within the field. Given our research lies within the intersection of participation, planning and technology, we will now shift our focus to introducing digital tools used in this field. We will give an overview of digital participatory

tools, specifically 3D visualisation tools for communicative planning, where also UAI, the technology at the centre of our study, can be categorised.

2.1.2 Digital Tools for Participatory Planning

Digital participation tools in urban design have gained prominence in the last decades (Gün et al., 2020). The tools for engagement differ significantly in the level of participation required from users, the desired goals of participation, and the complexity of the technology involved. In their review of information and communications technology (ICT) based participation tools applied in Europe, Gün et al. (2020) identify five distinct goals that these tools aim to achieve, either serving a single or multiple purposes: problem identification, collecting design proposals for specific urban areas, generating new ideas to improve urban life quality, participatory budgeting, and crowdfunding (p. 201).

Therefore, under the umbrella term of digital tools for participatory planning, we find a wide array of technologies: digital games, web-based participation platforms, and mobile participation applications amongst others. Tools offering different capabilities, ranging from two-way textual communication in blogs to collaborative mapping for submitting map-based comments or ideas to 2D/3D geo-visualisation capabilities (Gün et al., 2020). While the various digital tools could be detailed extensively, we will focus on 3D visualisation tools for communicative planning, as we argue our chosen technology, UrbanistAI, can be categorised here.

3D Visualisation Tools for Communicative Planning

For explaining 3D visualisation tools, we primarily rely on the systematic mapping of academic literature conducted by Salla Eilola, Kaisa Jaalama, Petri Kangassalo, Pilvi Nummi, Aija Staffans and Nora Fagerholm (2023). This review, covering publications between 2013 to mid-2020, focuses on three-dimensional (3D) visualisation tools for communicative planning. To our knowledge, it remains the only systematic mapping of literature that investigates the scope and gaps in current research on these tools applied for public engagement, which highlights the limited research done in this field (Eilola et al., 2023).

3D visualisations can be categorised as geo-visualisations including geospatial data (such as Google Earth and 3D city models) or non-georeferenced (such as virtual worlds or game engines) (Eilola et al., 2023). While 3D visualisation tools mainly cover interactive 3D models, Eliola et al. (2023) also classify here pre-rendered static images[8]. Due to the inclusion, we find the UrbanistAI platform fits within this category, as we will further argue below.

Before we continue, it is important to address terminology. In the publications they reviewed, Eilola et al. (2023) came across diverse vocabulary used for describing 3D visualisation tools, such as 3D environments, participatory modelling, 3D renderings, and 3D representations amongst many others. They have chosen to use the term 3D visualisation tools for communicative planning, and we adopt this terminology as well, using 3D visualisation tools interchangeably for short.

There has been a growing interest in the possibilities of 3D visualisations to support public participation in communicative planning activities (Eilola et al., 2023). One of the key benefits of 3D visualisation tools is providing a 'common language' which all stakeholders can understand (Kwartler, 2005; as cited in Lovett et al., 2015). Given that urban planning solutions have traditionally been presented in 2D drawings, laypeople may find it challenging to visualise or imagine spatial ideas (Gün et al., 2020). This difficulty comes from a lack of training in 3D mental visualisation based on 2D drawings - a skill typically acquired during architectural education and professional practice (Yagmur-Kilimci, 2010; as cited in Gün et al., 2020). They may also lack design skills, making it challenging for them to fully engage in the planning activities. Therefore, a visual 'common language' can support effective communication between planners and stakeholders (Lovett et al., 2015). This approach can support the integration of experience-based knowledge of laypeople with the professional expertise of the planners, potentially leading to greater sensitivity to planning issues and resulting in improved decisions (Hruby et al., 2019; Lovett et al., 2015; Orland et al., 2001; as cited in Eilola et al., 2023)

Moreover, visualisations can stimulate valuable discussions. Meitner et al. (2005) note: "It seems that simply creating a picture of a proposed management alternative causes people to question and think about these proposals in ways that they might not typically do otherwise."

[8] 2D representations from 3D models that appear three-dimensional (*What Is 3D Rendering?*, n.d.)

(as cited in Lovett et al., 2023, p. 203). This is explained by images helping to provide a focus for debate regarding alternative scenarios (Sheppard, 2006; as cited in Lovett et al., 2015). These characteristics of supporting dialogue and discussion are well-aligned with the principles of Communicative Planning Theory (CPT). It has also been observed that 3D visualisation tools are primarily used in a workshop setting bringing participants together in a physical space and inspiring face-to-face discussions, rather than facilitating digital communication between people (Eilola et al., 2023). In-person discussions naturally require facilitation. Lovett et al. (2023) acknowledge the crucial role of the facilitator running the workshops using these tools. This aligns with the principles of CPT, where the planner acts as a facilitator mediating discussions among various stakeholders (Sager, 2009).

However, Eliola et al. (2023) conclude that nearly all of the reviewed cases were researcher-driven, with professionals, practitioners and the public rarely involved in the technology development. Furthermore, only four of the reviewed studies had been applied in a real-life setting. As Eliola et al. (2023) highlight, this indicates a significant research-practice gap which may prevent critical evaluation of the "benefits and limitations of 3D visualisations from communicative planning theory perspective in the complex reality of planning" (p. 14). Furthermore, most of the real-life cases focused on less sensitive planning contexts, such as park improvements, which did not require conflict management. This raises questions about whether these tools are suited for supporting consensus-building in more challenging situations.

To summarise, on the one side, there is interest in applying 3D visualisation tools from public and private stakeholders (Ketzler et al.; as cited in Eilola et al., 2023), and these tools have been identified as having important qualities for communicative planning, such as the creation of a common language between stakeholders, and stimulation of face-to-face discussions. However, there is limited research on how the 3D visualisation tools integrate with stakeholders in real-life settings, and how the practitioners perceive them (Eilola et al., 2023). Given the contradictory nature of participatory planning we do not claim these tools can 'fix' participation, yet, we do find it important to study them and contribute to bridging this gap in the literature.

Moreover, as the review by Eliola et al. (2023) also emphasises the benefit of inter- and transdisciplinary knowledge sharing to integrate and understand the technical and

participatory aspects of 3D visualisation tools, we are encouraged to study them from a techno-anthropological perspective.

While there would be more to explore of the tools studied in the 3D visualisation tools review, the emergence of text-to-image technology in 2022 has introduced a new dimension (Steinfeld, 2023). Our attention now shifts to giving an overview of text-to-image technology in the upcoming section to provide a foundation for understanding the UAI tool, which we will further expand on in the case context.

Text-to-Image AI Technology

Text-to-image technology allows the creation of images based on textual input (Lyu et al., 2022). Web applications, such as DALL-E, provide an interface for the user to enter text, for example, “a house with a garden” as shown in Figure 3, and an image depicting this scenario is instantly generated. The generated image is unique; it is not sourced from the web but created by the technology itself. As demonstrated, the generated images can illustrate objects and scenarios which seem three-dimensional. Therefore, we argue the generated images are comparable to pre-rendered static images, placing text-to-image technology within the category of 3D visualisation tools.

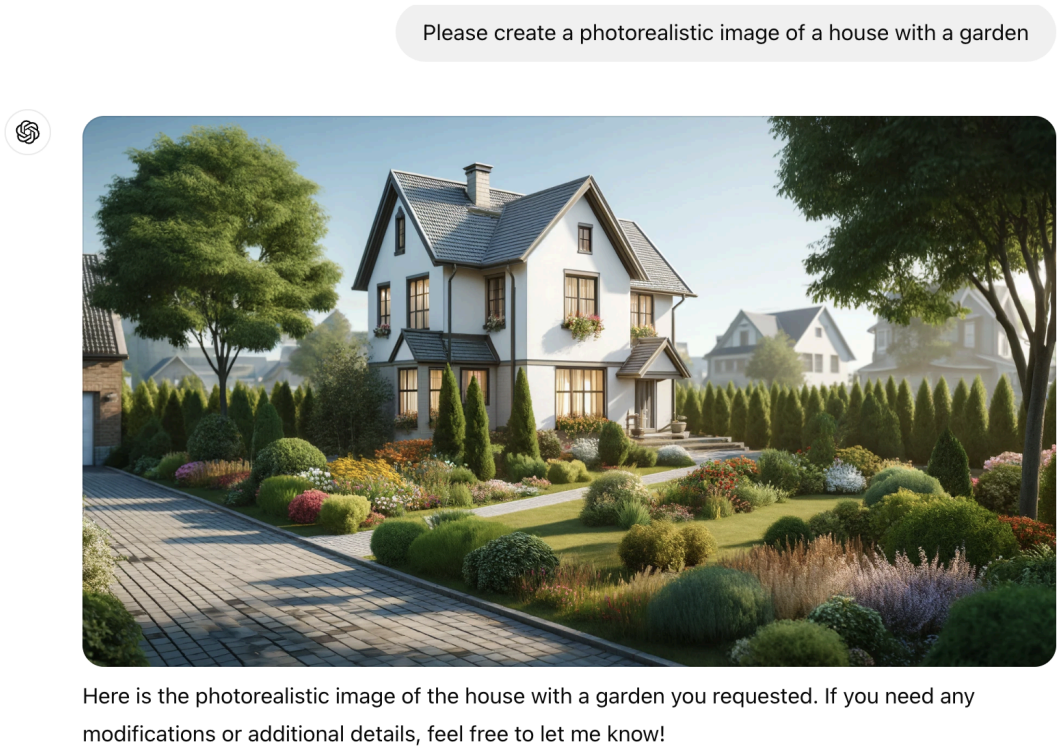


Figure 3, Image Generation in DALL-E, Snapshot (own production)

Text-to-image AI technology (also known as AI image generation) belongs to the category of generative AI, which creates new and unique content based on user input (Stryker & Scapicchio, 2024). The technology is founded on deep learning, a set of algorithms which are trained on vast datasets to determine the relationship between textual input and visual output (Stryker & Scapicchio, 2024). The key lies in the dataset used to develop the technology as that influences the images it will generate (Stryker & Scapicchio, 2024). A turning point for text-to-image technology came in 2022 with the emergence of tools such as DALL-E, Midjourney and Stable Diffusion (Lyu et al., 2022; Steinfeld, 2023). The latter released the technology as open-source, making it more widely available for the development of new tools using text-to-image technology (Rando et al., 2022).

The primary features of text-to-image tools typically revolve around generating new images based on user input. These tools often offer options to select specific sections of an image for generating new ones, blend multiple images or create images in a particular style. At the core of the functionality lies the user input, referred to as a prompt (Lyu et al., 2022). The variations in the generated images stem from the differences in deep learning algorithms and the datasets that have been used (Horvath & Pouliou, 2024; Rando et al., 2022).

Text-to-image tools enable users to generate photo-realistic images or imaginative illustrations - something previously accessible only to people with years of practice. However, while these tools are easy to get started with, there is a considerable difference in the visualisations based on the prompt that is entered. For example, a basic input like “house” may produce a generic result, while refining a prompt into a detailed description can take hours of trial and error to achieve the desired result (Brade et al., 2023). Also, there is a difference in how creative professionals use them compared to those without creative training (Lyu et al., 2022). Creatives using AI image generators rely on the vocabulary and knowledge they have acquired over the years. For example, photographer Boris Eldagsen, winner of the Sony Photography Award in 2023, revealed that he used DALL-E for the winning image to open up the debate around text-to-image tools (Williams, 2023). Eldagsen explained his process of creating the prompts:

> *The process has many steps, it’s not putting in three words and clicking ‘generate’. I identified 11 parts of the prompt; you create an image with text prompt, then when you want to leave the frame, do something to the image outside of the painting [for example, create imperfections to the surface, as there are on The Electrician], then again you have to describe, ‘What do I want to appear?’.. Two thirds of the prompts are only good if you have knowledge and skills, when you know how photography works, when you know art history. (Williams, 2023)*

So while text-to-image tools do make it accessible for anyone to generate images using words, creative professionals may have an advantage due to their familiarity with the required vocabulary and techniques.

Text-to-image tools raise significant concerns regarding intellectual property (Epstein et al., 2023) and bias, such as a tendency to depict Western lifestyles and a lack of diversity in representing non-Western cultural norms and environments (Nwatu et al., 2023). While we acknowledge the urgency of these issues, delving into their complexities is beyond the scope of this literature review. We do emphasise the need for future research to address these critical topics.

We will now briefly compare text-to-image technology with previously available 3D visualisation tools. Lovett et al. (2015) have pointed out that while pre-rendered still images

can have a high level of realism and are effective for discussing and comparing multiple scenarios, they also leave the viewer in a passive role with limited engagement. In contrast, text-to-image tools equally offer a high level of realism, allow the comparison for multiple scenarios, yet additionally provide the user with an interactive role. Therefore, text-to-image technology brings about new nuances within the features of 3D visualisation tools.

While it is possible to extensively uncover text-to-image technology, the underlying technology and related issues, the scope of this study confines our overview to the main characteristics shared. Having provided an understanding of these new directions within 3D visualisation tools, we turn our focus to the adoption of digital tools by municipalities.

2.1.3 Adoption in Municipalities

Planning practice is said to have an "ambivalent relationship with digital technologies" (Kitchin et al., 2021, p. 352) with planners often slow to adopt certain ICT-s into their practices (Potts & Webb, 2023). Common issues for adoption within municipalities have been persisting since the 1980s despite ongoing technological development and education (Potts & Webb, 2023). These barriers include the cost of developing and purchasing software, tools being difficult to use and planners lacking the necessary technical skills (Geertman & Stillwell, 2012; Champlin et al., 2018; Russo et al., 2018; as cited in Potts & Webb, 2023). Potts et al. (2023) argue that research has been focused too much on the challenges and benefits of specific technologies, and advocate for a more "holistic view of how to embed and support ICTs within planning organisations" (Potts & Webb, 2023, p. 535).

It is evident that one of the main factors in adoption surrounds the practitioners themselves. Contemporary planners face high demands regarding the skills and tasks they are expected to have (Potts & Webb, 2023). As Potts et al. (2023) point out, it is understandable that the use of digital tools is fragmented, as planners try to balance these demands with the application of digital technologies. Therefore, Potts et al. (2023) highlight the need for creating supportive social learning environments within organisations to support the adoption of digital tools.

2.1.4 Research Opportunities

In our literature review, we have outlined the contradictory nature of participation in planning, highlighting the complexity of participation, which is continuously influenced by various factors. We take inspiration in Brownill and Inch's emphasis on embracing contradictions and grounding research in the everyday practices of planners (Brownill & Inch, 2019).

Given the potential of 3D visualisation tools, notably with the emergence of text-to-image technologies, we find it important to study these tools, especially since there have been limited studies in real-life settings (Eilola et al., 2023). Guided by the principles of recognising this complexity, we do not view any digital tool as a 'fix' for participation, as warned by Brownhill & Inch (2019). Additionally, in line with Eilola et al. (2023), we believe that to avoid a research-practice gap, it is important to closely relate to the real-life practices of planners and study the practice itself rather than hypothetical scenarios of using these tools. This is also why we have chosen a case study approach, which we will expand on in Chapter 3. Overall, we see the need to leverage a techno-anthropological skillset using interactional expertise[9] to not only identify the barriers to adoption but also to engage in dialogue with practitioners to reflect on these challenges.

Next, we will provide an overview of our chosen case study - the use of UAI in a Northern European city government.

[9]By interactional expertise, we refer to the specific interface between experts and users in "The Techno-Anthropological Triangle" - see fx. Boersen & Botin (2013). The interfaces between the three components in the triangle represents central techno-anthropological competencies.

2.2 Case Context

In the following subsections, the reader gets an introduction to the various elements of the case study. Firstly, we will elaborate on UAI covering the team's motivation for developing the platform, expand on the text-to-image technology that the UAI platform is based on, and give an overview of the features and limitations of the UAI tool as well as most commonly used workshop methodologies when using the platform. Secondly, the reader will gain insight into the Northern European capital, including an overview of the city's structure regarding urban and spatial planning, and we will provide a brief overview of the city's approach towards participatory planning. Lastly, we will introduce the steps leading up to the beginning of the Pilot Phase of using UAI in the city government.

2.2.1 UrbanistAI

The following introduction to UAI is to a large degree based on informal talks with the UAI team and observations of UAI practices during our five month long internship with UAI in the fall of 2023.

The UAI platform was created in 2020 by an interdisciplinary team from the Italian AI Software engineering company, Toretei, and the Finnish-based urban planning research group, SPIN Unit, who bring together backgrounds in urbanism, software engineering and design (Toretei, n.d.; UrbanistAI, n.d.). The members of the UAI team are additionally closely affiliated with academia either by conducting research or teaching.

The need behind the development of the UAI platform and workshop methodology stemmed from the SPIN Unit team's previous experience in participatory planning. Through a decade of experience, they had organised urban analysis workshops involving municipalities and the broader public. During this period, the team noticed a growing interest among city officials for the public and other stakeholders to take on a more active role in the planning process. Motivated by this, the SPIN Unit team wanted to find new and improved ways to engage the public in visualising and re-imagining ideas for urban spaces (UrbanistAI, n.d.).

The team developed the UAI platform, a web application designed for collaboration in urban and spatial planning projects. The platform uses text-to-image artificial intelligence (AI)

technology (also known as AI image generators), allowing users to input text and generate unique images or modify existing ones based on the user's input. The UAI tool is built on an open source diffusion based generative AI model which is then further trained and tuned with photographs of cities the UAI team have been taking the past few years (Lorenz, personal communication, 3 June 2024). The most common use case of the UAI platform is conceptualising new solutions for an existing space in the city (UrbanistAI, n.d.). For example, users can upload an image of a particular area in the city and generate new visuals based on the text they provide. This process is illustrated in the Figure 4 below:

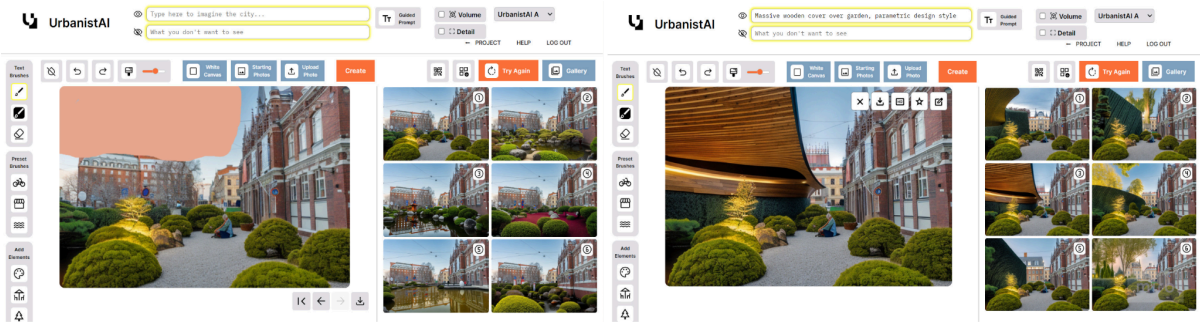


Figure 4, Example of Image Generation in the Professional Interface, Snapshot from the UAI platform (Larsen & Lindström, 2023, p. 16)

For example, UAI was used in a workshop for designing new summer streets in Helsinki (UrbanistAI, 2023). Before the workshop, the platform was fed images of the existing streets highlighting specific areas open to manipulation and workshop participants worked together to create textual descriptions and explore solutions they liked. The visual illustrations from the workshop were used as input for developing the summer street designs (UrbanistAI, 2023).

Workshop Methodology

The UAI team sees itself primarily as an urban consultancy, not a technology company, and a significant part of the team's expertise lies within urban and participatory planning. The team highlights the importance of using the UAI tool within a workshop framework that supports communication and dialogue. An example of such a framework is shown in Figure 5. Collaboration with clients, mostly municipalities, varies depending on their familiarity with participatory planning and budget agreements. The team offers two main approaches when engaging with new clients: either the clients participate in a boot camp training led by the

UAI team, or additionally, the client receives further assistance in facilitating workshops (UrbanistAI, 2023).

Boot camp participants typically include urban professionals or participation specialists responsible for organising workshops. During the boot camp, participants learn about the basics of generative AI, how to use the UAI platform, and create effective prompts. The UAI team also presents a proposed framework for participatory planning workshops with the UAI platform, involving ideation phase where the participants get familiar with the tool, an experimentation phase for generating solutions for a specific site in the city, and a concluding phase for sharing results with other workshop participants.

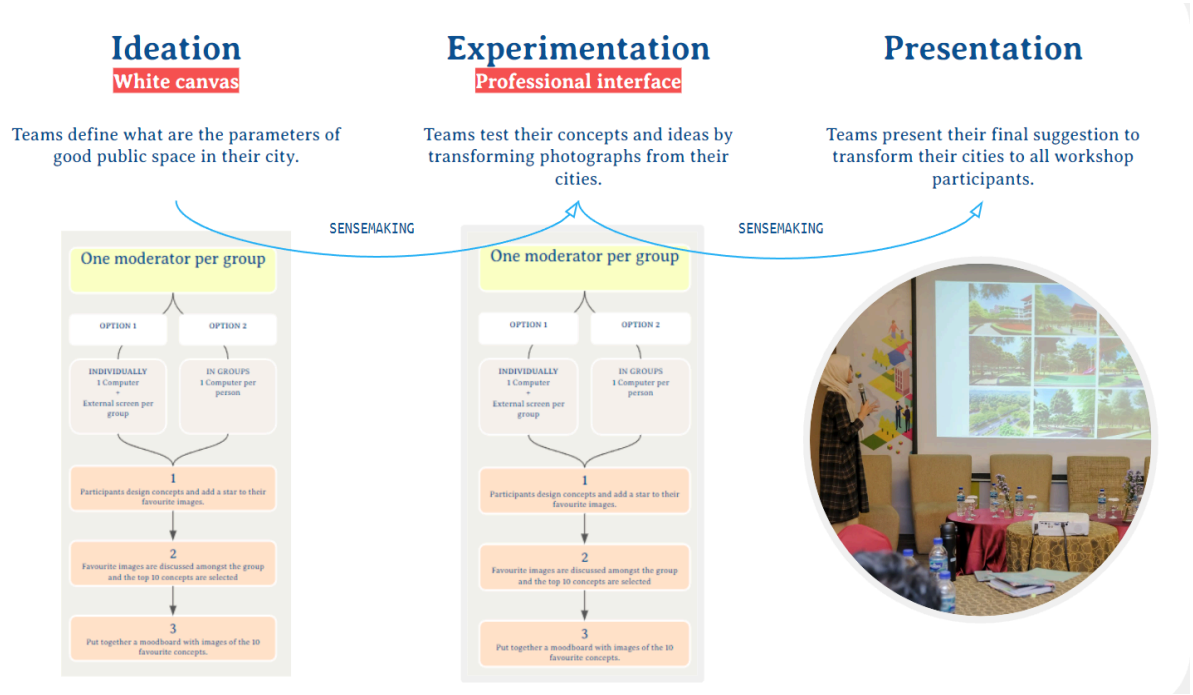


Figure 5, General framework for AI-aided participatory design workshop by UAI
(Larsen & Lindström, 2023, p. 19)

Main Features

We will now introduce the main features of the UAI tool: White Canvas, Professional Interface, and collaborative features, which align with the needs of the workshop method. The *White Canvas* enables creating visualisations that are not site-specific aiming to familiarise the user with writing prompts. Users can either write the prompts themselves - Figure 6 - or use the built-in *AI Prompts Builder*, which generates guided prompts based on the options offered by the tool. Figure 7A illustrates an example of using the AI prompts

Builder in the White Canvas in which the user selects ‘Greenery’, ‘Japanese Garden’, and ‘Entertainment & Culture’ from the given categories.

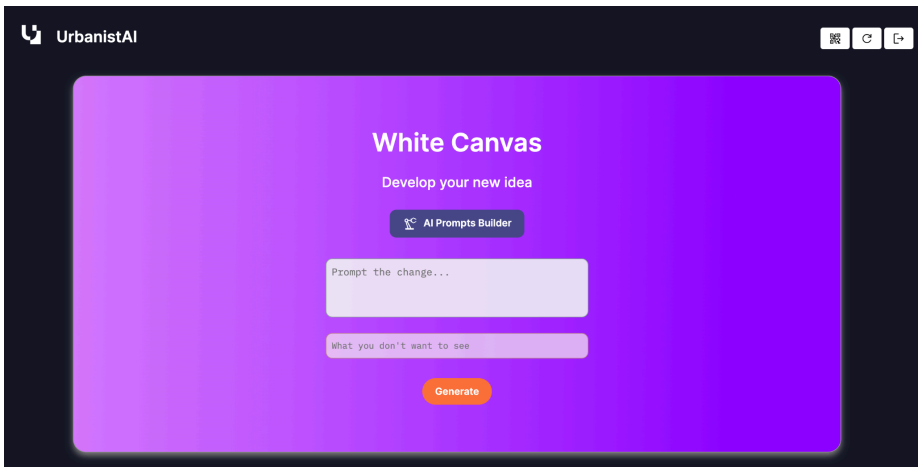


Figure 6, The White Canvas Interface, Snapshot from the UAI platform
(Larsen & Lindström, 2023, p. 14)

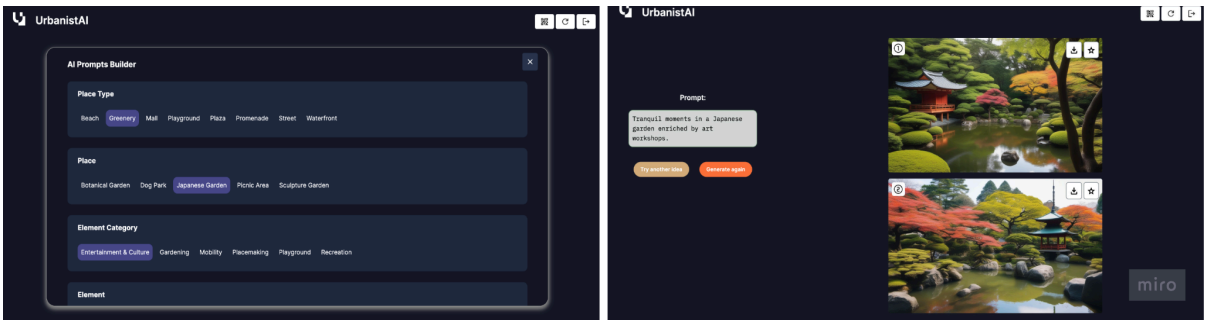


Figure 7A & 7B, AI Prompts Builder & Example of Image Generation in the White Canvas Interface using the Prompt Builder, Snapshots from the UAI platform (Larsen & Lindström, 2023, p. 15)

Based on the user’s selections, the *AI prompts builder* generates a prompt “Tranquil moments in a Japanese Garden enriched by art workshops” and the two images as shown in the smaller thumbnails in Figure 7B. The generated prompt has added characterising qualities like *tranquil* and *enriched,* following the *6 golden rules* of prompting the UAI team recommends, so the image would be able to represent the feeling the user has imagined - see Figures 8A & 8B.

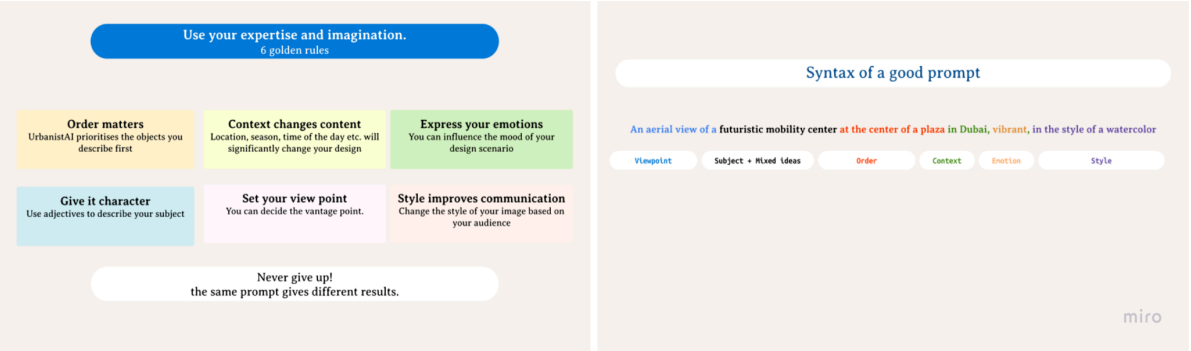
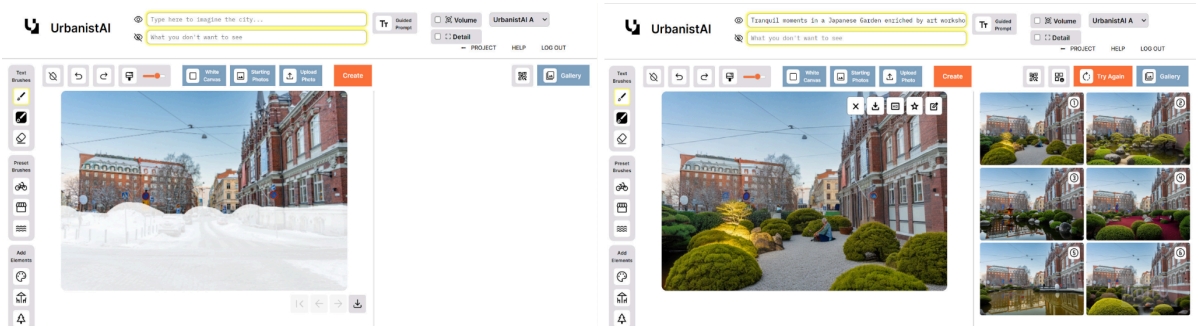


Figure 8A & 8B, UAI Presentation Slides with the 6 Golden Rules & the Syntax of a Good Prompt (Larsen & Lindström, 2023, p. 16)

The aim of the *Professional Interface* is for the users or workshop participants to visualise their ideas in a site-specific context. This is done by adding the idea to actual photos of the area in question and then allowing the tool to generate multiple suggestions of how this might look. The Figures 9A & B show this step. The white, slightly transparent area in Figure 9A marks the space that is included in the urban re-design project, which is prepared by the workshop organisers before the workshop. Figure 9B then shows how entering a prompt generates six options from which the user can then choose to continue elaborating and detailing one of the generated images or choose to modify the photo with a new (or the same) prompt to see what solutions the UAI tool might propose.



Figures 9A & 9B, Starting Photo in the Professional Interface & Example of Image Generation in the Professional Interface, Snapshots from the UAI platform (Larsen & Lindström, 2023, p. 16)

While we have outlined how users can use the UAI platform independently, these features are meant to be used collectively within a workshop setting, so the trial-and-error process of creating prompts and generating images is informed by the discussions and agreements within group members. Certain built-in features aim to enhance collaboration such as *Live Results* and *Group Galleries* interfaces that enable multiple devices to access a workshop

group and view the generated visuals in real-time. It is important to highlight that the UAI platform features are valuable, yet offer limited support and guidance for collaboration, so facilitating an effective discussion relies heavily on the workshop moderator and activities.

2.2.2 The City Government

The following description of the city government and its organisational structure builds on an exploration into the city government's official and publicly available organisation charts and government landscape, as well as the semi-structured individual interviews with 8 city officials conducted for the purpose of this thesis study. Due to agreements of anonymity with all informants, we have chosen to keep the specific location of the city hidden, which allows us to disclose details of the city government's organisational practice that might be considered sensitive information, and still be complying with the agreements of anonymity. This is also the reason for the rather few references in this case description.

The city government is currently undergoing rapid changes, facing tensions within the municipality regarding the general vision for the city's development. For nearly two decades, the city was led by a left-conservative party, known for its populist actions like implementing free public transport, which led to a decline in quality and supported a car-dependent environment. Recent public demands for sustainable city planning have spurred significant changes. In 2020, the city's Strategic Management Office (SMO) was established to address urban development challenges, bringing in architects and planners dedicated to sustainable urban planning principles such as reducing car usage, building bike lanes, and creating more green areas.

Recently, a new coalition introduced new perspectives, with the Urban Planning department being led by a new deputy mayor and former urban activist. Furthermore, numerous long-serving leaders in the municipality have been replaced, bringing in more proactive specialists dedicated to improving urban planning practices. However, agreeing on a unified vision remains challenging. This has led to differing views among city officials, with some advocating for car owners' rights and others promoting inclusive street designs, reflecting the broader institutional disagreements on urban planning.

What makes a unified approach even more challenging is that spatial planning is fragmented across several departments. We will now introduce the various departments responsible for spatial planning related activities:

- ***Strategic Management Office (SMO), Spatial Planning department*** - creates master plans and general visions for the city; organises idea and architectural competitions, curates art exhibitions and tactical urban planning interventions; provides consultancy within the city government
- ***Urban Planning Department*** - amongst other departments, it includes the Zoning Plans Service, which is the only planning process that has mandatory public participation by law
- ***Urban Environment & Public Works Department*** - manages public infrastructure planning, construction and maintenance, including streets and parks
- ***Transport Department -*** develops city transportation and mobility infrastructure
- ***Neighbourhood Municipalities -*** handle neighbourhood specific projects with urban specialists and/or architects

The SMO strives to unify the spatial planning approach across departments, a challenging task, but one that has led to increased collaboration and recognition within the city. Thus, even without public involvement, achieving consensus among various departments may be difficult, as planning projects typically require cross-departmental collaboration.

Participatory Planning Practices

The Zoning Plans Service projects require public participation by law, but alongside the changes taking place in city governance, the city has also been increasingly involving the public in various other projects beyond the legal requirements.

Both the Spatial Planning Department and the Urban Environment & Public Works Department, with its new Participation & Urban Gardening subsection, use diverse techniques to engage relevant stakeholders. For example, for a recent street design competition, the top five entries were presented to locals for feedback before the jury made a final decision. Additionally, in recent years a physical space in the city centre (from now on referred to as the Participation hub) was created to facilitate participatory planning activities.

The field of public participation is expanding in the city, with specialists gaining experience through various projects. The most common engagement method continues to be public discussions.

Digital tools are also used in the engagement activities, but with mixed results. For example, an Augmented Reality application for a green area project effectively engaged young people, but the high cost of development and maintenance led to its discontinuation. Maptionnaire, an interactive survey tool, has also been used, but some practitioners find its UX-design challenging or are unsure how to manage the large amounts of data it collects. The participation hub, intended to showcase and use a vast amount of digital participatory tools, works well as a physical space for events and collaboration among departments. However, tools developed by researchers from the city's technical university, like a virtual Green Planner and a 3D model for VR, have not been adopted by the city government practitioners.

Pilot Phase of UrbanistAI

A major decision was made to finance a new tramway for one of the capital's busiest streets. The SMO Spatial Planning Department advocated for an architectural competition to incorporate sustainable planning practices but faced tight deadlines, and therefore, had to seek out alternative solutions for including expert knowledge and public engagement. Simultaneously, a connection between the UAI team and the Ministry of Climate was established, exploring opportunities for collaboration. Through personal connections, SMO became interested in using the UAI platform for this purpose. The workshop preparations took nearly six months, during which activities were coordinated between UAI and SMO.

In the Street Redesign Workshop, urban planning experts and local business stakeholders re-imagined sections of the street. The workshop was facilitated by the SMO architect-urban planners together with a small team from UAI. During the presentation of the results two deputy mayors attended, adding a formal and political atmosphere to the event. The workshop's output was included in the procurement requirements for the street, which are yet to be publicly announced. The workshop was deemed a success, leading the Head of Digital Services to agree with UAI on a six-month Pilot Phase, after which the tool's usage would be evaluated. Figure 10 provides an overview of the main events in the UAI-city government relationship.

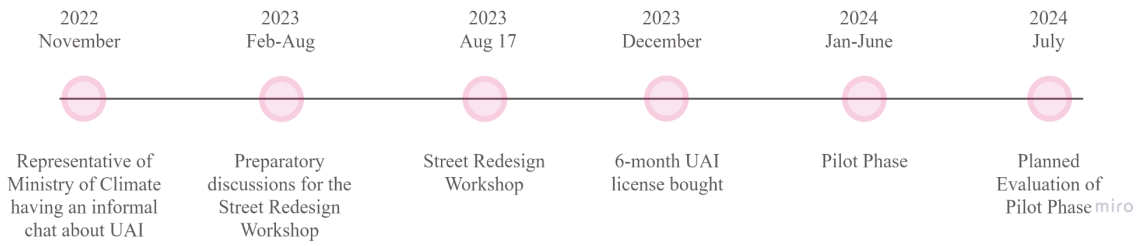


Figure 10, Timeline of Events of UAI's Collaboration with the City Government (own production)

Now that we have outlined the research area in the literature review and provided an overview of our case study, we will share in more detail the approach that will guide our study.

2.3 Research Angle

We are stepping into a messy arena, one that is made of multiple phenomena - participation, planning and technology - which are all shaping, forming, and impacting each other. In our literature review, we have highlighted the complexities within participatory planning, which is continuously influenced by novel factors. We ground our research in Brownill and Inch's emphasis on embracing contradictions and grounding research in the everyday practices of planners (Brownill & Inch, 2019).

Emerging tools like UAI, which uses text-to-image technology for collaborative urban planning, are similarly not fixed entities. They evolve based on user interactions, the contexts in which they are applied and the underlying technological features. Our research, therefore, navigates a delicate web of interrelationships.

Researching UAI in the Northern European city government provides an opportunity to explore this complexity within an institution which is also undergoing significant changes, striving to unify and balance efforts across different departments towards a shared vision. Research shows that the adoption of new digital tools in municipalities, whether for planners' professional use or for public participation, is particularly challenging (Potts & Webb, 2023), making the Pilot Phase crucial for study.

Our research aims to support their decision-making, yet we do not intend to conclude whether the city should or should not adopt UAI into its participatory planning practices. Our research question - How can the Pilot Phase of UrbanistAI in a Northern European City Government help understand the challenges of adopting 3D visualisation tools for participatory planning in municipalities? - seeks to explore the multiple realities enacted during the Pilot Phase of UAI in the City Government, as well as the fluid characteristics of the tool within a setting that is also continuously evolving. This exploration aims to help the city government conceptualise the tool and understand how different practitioners perceive its possibilities and limitations. Our contribution will be formulated as a set of considerations and reflections, which will be presented to the city officials and the UAI team near the end of the Pilot Phase as they themselves begin evaluating whether or not to continue with the tool.

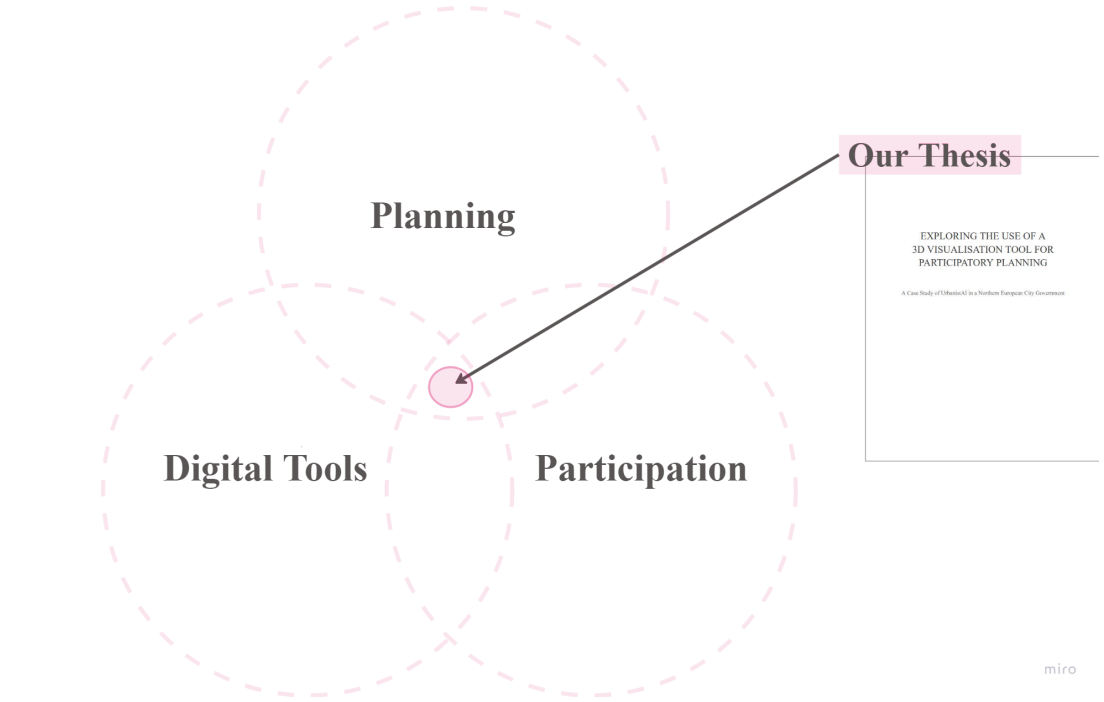


Figure 11, The Thesis Research Position (own production)

We find that a techno-anthropological lens is particularly fitting for a research that integrates participation, digital tools, and planning - see Figure 11 - as a social-technical approach supports bringing these topics together.

This concludes the second chapter. From having established how the literature poses interesting research opportunities, to declaring how the Pilot Phase of UAI in a Northern European city government as seen through a techno-anthropological lens allows us to seize these opportunities, we now move on to elaborating how we have done so.

CHAPTER 3

3.1 Research Design

The foundations for carrying out this research began in June 2023, when we had our first meeting with one of the co-founders of UAI. He had the role as an expert on text-to-image generative AI tools in participatory planning, which was part of our eight semester project on the techno-anthropology master's programme. In the following semester, we completed a four-month internship with UAI and came to learn about their collaboration with the City Government, which sparked our interest and led us to choose the Pilot Phase as the focus of our thesis.

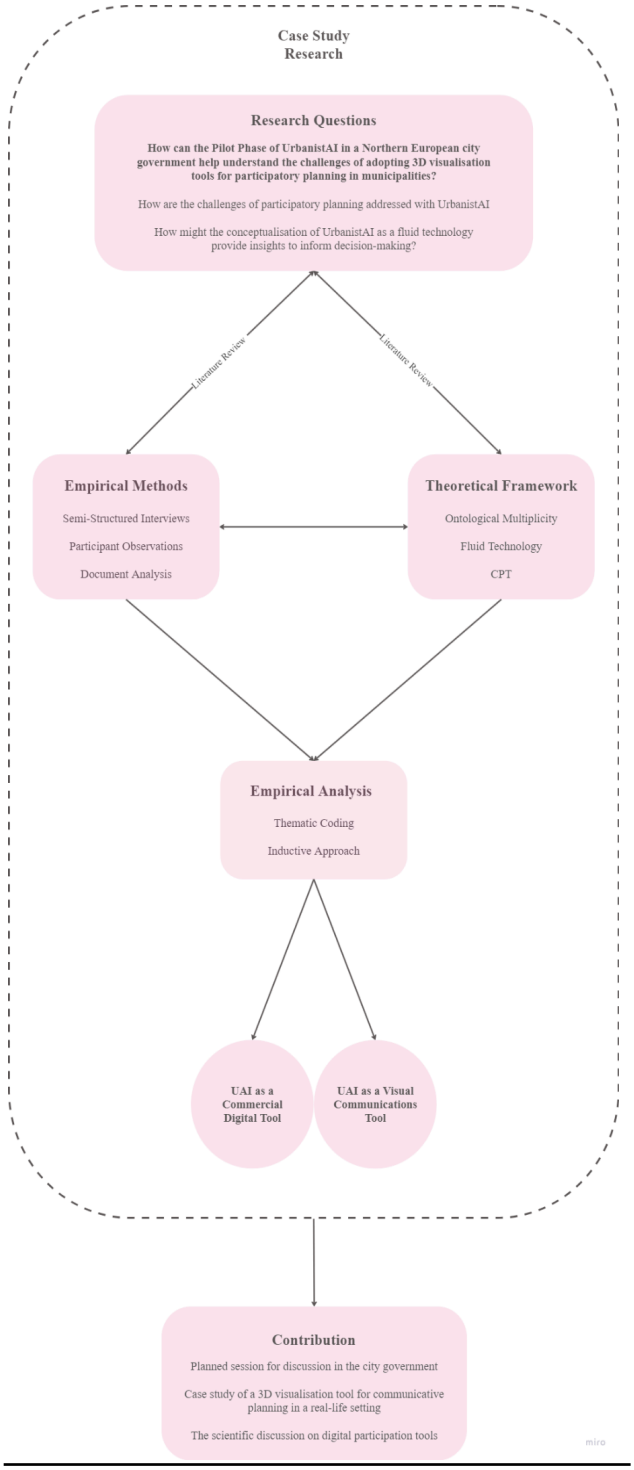


Figure 12, Research Design (Own production)

The research for the thesis then began with a self-assessment of our initial inquiries, and a practical question of how we would best explore the use of UAI.

Throughout this project, we have had an iterative approach to the research design. This means that we have allowed for multiple reflections to figure out how to best investigate the use of UAI during the Pilot Phase and ensure that; 1) we stayed true to the field of techno-anthropology, 2) our personal goals for our thesis study were met, and 3) we contribute to the situational needs of the case stakeholders. Figure 12 illustrates the primary components of our research design and how we have addressed the research questions, which we find to be in accordance with the three statements above.

The observant reader will notice that the arrows between the components in the top half of the figure points in both directions. This aims to show how each of these parts have co-constituted each other in the research design, and all together inform the analytical approach. The lower box in the figure illustrates the feedback session together with stakeholders from the city government and UAI, which is planned to take place after the delivery of the thesis report. The purpose of the session is to share our findings from the study and to facilitate a dialogue with and between the stakeholders on the basis of our presentation. Through the facilitation of such a session, we equally aim to learn how a techno-anthropological exploration of this specific case has contributed to their practice.

Throughout chapter 3, we will describe and reflect on the components in the research design Figure 12, why we have found them fitting for our research, and what their contributions are. The chapter begins with a dive into the theoretical framework, followed by the methodological choices and reflections, finishing off with a description of all the different methods for producing our pool of empirical material.

3.2 Theoretical Framework

3.2.1 Integrating CPT with Post-ANT

Our analytical framework is, as mentioned, a combination of three different, but, as we aim to argue, compatible "theories"[10] and concepts. We draw on Communicative Planning Theory (CPT) (Healey, 2012) to ensure that the goals and aims of urban planning practices are present in our investigation because we want to acknowledge its influence on planning practices and practitioners. However, CPT does not have a vocabulary with which we can explore how objects and technologies interact in planning practices. Robert Beauregard (2012) also points out this omittance of objects within planning theories in general: "The things that are planned, the tools that are deployed, and the spaces of practice are of little theoretical interest. Rather, planning theorists privilege human actors." (Beauregard, 2012, p. 133). Building on Beauregard (2012), we therefore find it both reasonable and beneficial to combine CPT with concepts from our own techno-anthropological toolbox. We utilise the two concepts, Ontological Multiplicity[11] (Mol, 1999, 2002) and Fluid Technology (Bylund, 2013; de Laet & Mol, 2000; Law & Mol, 2001) from the Post-Actor-Network Theory (Post-ANT) tradition, to explore interactions with UAI in the Pilot Phase.

Jonas Bylund (2013) brings out that Science and Technology Studies (STS) and in particular Post-ANT has a "... strong focus on the knowledge practices between science, formal politics and the everyday lives of humans and other actors" (p. 248). He continuously argues for the benefits to consider this combination from a planning studies point of view and compares Post-ANT's focus on mediation to connect people and things to Beauregard's understanding of the purpose of planning (Bylund, 2013).

[10] We write "theories" because proponents of ontological multiplicity and fluidity do not consider these solely as theories nor as methodologies. ANT and Post-ANT scholars claim that a definition as a theoretical perspective comes with a set of fixed concepts and convictions. Instead *"the aim must be to contribute to a living "vessel" of intellectual resources"* (Gad & Jensen, 2010, p. 76).

[11] Ontological Multiplicity is a concept and development of ANT that carries many names; Multiplicity, Multiplicity-Oriented ANT, Turn to ontology. In this thesis we will make use of Multiplicity and Ontological Multiplicity interchangeably.

The relevance of Post-ANT for planning is further explored in the book "Actor Network of Planning" (Rydin & Tate, 2016a)[12]. In the introduction of the book, Yvonne Ryding and Laura Tate share three aspects from Post-ANT that they find of relevance to planners:

> *An appreciation of the nuanced ways in which plan and policy creation and implementation relationships are developed and nurtured (or not); a complex and context-specific identification of power dynamics, with the potential to build more empowered and sophisticated responses in future cases; and greater understanding of the potential for and challenges of promoting progressive agendas and, with such understanding, potentially creating a launching pad for proactive responses. (Rydin & Tate, 2016b, p. 9)*

Having this in mind, we now want to briefly re-introduce CPT, followed by an elaboration of Ontological Multiplicity and Fluid Technology within our analytical framework, and how we find that this integration of the three components allows for a comprehensive analysis of the Pilot Phase.

3.2.2 Communicative Planning Theory

CPT provides the foundational layer for understanding the participatory planning practitioners in the Northern European capital. CPT emphasises the importance of communicative processes, deliberation, and consensus-building in urban decision-making (see Chapter 2: Communicative Planning Approach), and serves as a backdrop for the exploration of participatory planning practices during the Pilot Phase. Even though CPT advocates for a communicative approach throughout the entire planning process, then in practice, as brought out in literature review, these principles are not consistently applied. We acknowledge that the planners in our case study may also have to balance between swift and slow approaches, implementing CPT principles when possible within the constraints of their real-world responsibilities (Calderon et al., 2024).

[12] Several Post-ANT scholars do not always explicitly write out when they are talking about the more classical understanding of ANT (early Latour and Callon) or when they are talking about the newer developments of ANT. The newer developments is what we term Post-ANT, but in the case of Rydin & Tate (2016a) they use ANT for both classic ANT and Post-ANT. Other scholars denote it After-ANT, Multiplicity, turn to ontology (Gad & Jensen, 2010)

We will elaborate on how CPT has influenced the choice of methods in the methodology section, but for now, we will introduce the concepts with which we can address socio-technical systems: Ontological Multiplicity and Fluid Technology.

3.2.3 Ontological Multiplicity

Ontological Multiplicity emerges from a shift in STS, particularly through the development of Actor-Network Theory (ANT) and its evolution into Post-ANT, which refocuses the debate from epistemology - how we know what we know - to ontology - what exists (Mol, 2002). Early ANT scholars like Bruno Latour and Michel Callon emphasised the role of human and non-human actors in the co-construction of social realities, challenging the traditional separation between society and technology. They recognised that technologies are not neutral tools but actively shape and are shaped by social practices, power relations, and institutional contexts (Gad & Jensen, 2010; Vikkelso, 2007). However, it was Annemarie Mol and John Law who, around the shift to the 21st century, explicitly pushed this narrative towards ontological multiplicity, proposing that rather than uncovering a single reality, socio-material practices enact multiple realities simultaneously (Gad & Jensen, 2010; Mol, 1999, 2002). At the start of her book "the body multiple", Mol (2002) shares her purpose:

> *It is possible to refrain from understanding objects as the central point of focus of different people's perspectives. It is possible to understand them instead as things manipulated in practices. If we do this - instead of bracketing the practices in which objects are handled we foreground them - this has far-reaching effects. Reality multiplies. (p. 4-5)*

This philosophical turn is significant in the realm of science because it proposes that practices can lead to the existence of multiple, equally real versions of an object or phenomenon within the same space and time. Mol (2002), in her ethnographic study of the treatment of atherosclerosis in Dutch hospitals, demonstrates how the disease is differently enacted in various departments - surgery, pathology, dietetics - with each bringing the disease into being in its unique way. As part of the turn to ontological multiplicity, Mol (2002) highlights that this calls for investigations into how different realities relate to one another. To investigate the enactments and their relations, Mol (2002) proposes a set of questions:

> *...[H]ow does the coordination between such objects proceed? [H]ow do different objects that go under a single name avoid clashes and explosive confrontations? [M]ight it be that even if there are tensions between them, various versions of an object sometimes depend on one another? (pp. 5-6)*

So to follow the ideas of ontological multiplicity as expressed by Mol (2002), we dive into the common, day-to-day, socio-material practices because ontology is not a given phenomenon, rather it is something that is practised, enacted and done.

Applying Ontological Multiplicity to Study UrbanistAI

When applied to our study of UAI, ontological multiplicity provides an analytical lens to explore how this digital tool takes part in creating multiple realities. Each interaction with UAI - whether by architect-planners, digital or participation specialists - is not solely a use of a tool but should be treated as a socio-technical interaction that can enact various versions of participatory planning.

In approaching UAI as an object within the concept of ontological multiplicity its role then extends beyond a passive facilitator in collaborative urban planning activities; it is an active participant that influences and is influenced by the interactions within the environment. With ontological multiplicity, we are able to examine how UAI not only responds to but also shapes the participatory planning processes through its capabilities to visualise and modify situational images instantaneously and collaboratively. Therefore we zoom in on the interactions with UAI, which have taken place throughout the Pilot Phase.

3.2.4 Fluid Technology

Around the same time as Mol and Law (among others) contributed to the turn to ontology, they also coined the concept of Fluidity. Mol together with Marianne de Laet (2000), investigated fluidity with a focus on technology - Fluid Technology - whereas Mol and Law (1994, 2001, 2002) focused on fluidity in terms of spatial topologies - Fluid Space. For the theoretical framework in this study, we will primarily focus on the concept of fluid technology (in the vocabulary of multiplicity one would say that we are practising ‘fluid technology’). For a better understanding of the concepts, we will provide an introduction to

fluid space and how urban spaces might benefit from such a focus. We will then elaborate on the concept of fluid technology and explain how we aim to operationalise it.

Fluid Space

The concept of fluid space emerges from the interplay of various practices in science and technology as explored by Law and Mol in their respective works (Law, 2002; Law & Mol, 2001; Mol & Law, 1994). This concept challenges the notion of static spaces within scientific and planning disciplines, proposing instead that spaces are dynamic entities continuously shaped by technological, social, and human interactions (Law, 2002).

In "Situating Technoscience: An Inquiry into Spatialities", Law and Mol (2001) examine how technoscientific practices contribute to the ongoing formation and reformation of space. They argue that spaces such as laboratories and hospitals are not only physical locations but are actively produced through the practices that take place (Law & Mol, 2001). This idea is further explored in Law's "Objects and Spaces" (2002), where he discusses the agency of objects in creating and defining spaces, suggesting that objects and the spaces they inhabit are co-constitutive. This perspective is essential for understanding how technologies and space interact, continuously influencing and reshaping each other.

By extending these insights into urban planning, the work of Law and Mol (2001), together with Bylund (2013), highlights that urban spaces, much like the technoscientific ones, are not fixed but are continually being reshaped and redefined by their inhabitants and the interactions within these spaces. Bylund (2013) emphasises that urban planning tools need to be as adaptable and responsive as the cities they are meant to serve, mirroring the fluidity of urban environments where change is the only constant.

This dynamic understanding of space sets the stage for considering the role of fluid technology in urban planning. Just as fluid spaces require adaptable and flexible planning approaches, so will they similarly, following the research of Mol, Law and Bylund, benefit from fluid technologies that can adjust to diverse and evolving urban needs.

Fluid Technology

Fluid technology, a concept initially explored by de Laet & Mol in "The Zimbabwe Bush Pump: Mechanics of a Fluid Technology" (2000), introduces the idea of technologies that are adaptable, versatile, and robust across various environments. This notion complements the earlier discussion of fluid space by emphasising how objects and technologies, like spaces, are not static but dynamically interact with their environments. The primary feature of fluid technologies is their ability to adapt and transform in response to user needs and environmental conditions (de Laet & Mol, 2000). This concept argues that the effectiveness of a technology is often determined by its adaptability to various social and environmental conditions, its capacity to be altered to meet different needs, and its ability to perform under a range of operational conditions. De Laet & Mol (2000) illustrate this through the Zimbabwe Bush Pump, a technology praised for its simplicity and effectiveness in diverse settings:

> *The Zimbabwe Bush Pump is solid and mechanical and yet, or so we will argue, its boundaries are vague and moving, rather than being clear or fixed. Likewise, the question as to whether or not the Bush Pump actually works, as technologies are supposed to, can only rarely be answered with a clear-cut 'yes' or 'no'. Instead, there are many grades and shades of 'working'; there are adaptations and variants. Thus the fluidity of the pump's working order is not a matter of interpretation. It is built into the technology itself (p. 225).*

This adaptability is crucial for technologies deployed across different cultural and infrastructural contexts, allowing them to serve a broad range of applications. Law (2002) expands on this by discussing how technologies actively participate in shaping and defining the spaces they occupy, highlighting their co-constitutive relationship with space.

Fluid Technology in an Urban Context

In urban environments, characterised by constant change and diverse stakeholder interactions, technologies must be as fluid as the spaces they are designed to serve (Bylund, 2013). Bylund (2013) underscores the need for urban planning tools to accommodate the dynamic nature of cities, suggesting that tools which exhibit fluid characteristics are likely to be more effective. When practising urban planning as a fluid space, it will also benefit greatly from adopting fluid technologies that are capable of responding to shifting urban dynamics. This approach aligns with Law and Mol's insights from "Situating Technoscience: An Inquiry into

Spatialities" (2001), where technoscientific practices are shown to contribute to the ongoing evolution of spaces, reinforcing the need for technologies that can evolve together with these spaces.

Applying Fluid Technology to Study UrbanistAI

Given the changing nature of urban spaces, it is beneficial to investigate UAI through the lens of fluid technology. With our analysis, we aim to explore whether and how UAI exhibits characteristics of fluid technologies - particularly its adaptability in diverse participatory urban planning contexts and its ability to meet varied user requirements. While it is not predetermined that UAI qualifies as a fluid technology, the investigation will focus on its potential to function as such within the complex, fluid urban environment of the participatory urban planning processes in the city government.

Exploring UAI as a potential fluid technology involves examining how the platform adapts to different participation scenarios, how it integrates stakeholder feedback, and how it supports or catalyses changes in participatory planning practices. This exploration is guided by the understanding that fluid technologies, as demonstrated in the Zimbabwe Bush Pump study (de Laet & Mol, 2000), are not only adaptable but also strengthen the capacities of their users to interact with and shape their environments.

3.2.5 Framework Components

Given that ontological multiplicity and fluidity are concepts that are closely related, yet distinct, we use the comparative table below to differentiate between the two to help clarify their connections and distinctions as applied to our research:

Concept	Ontological Multiplicity	Fluid Technology
Purpose	Focuses on the existence of multiple, co-existing realities and how different practices enact these realities.	Focuses on the adaptability and responsiveness of technologies to user needs and different conditions.
Key Contributors	A. Mol, J. Law.	A. Mol, M. de Laet, J. Law.
Benefits	Enhances the understanding of complex social phenomena. Encourages inclusive policy-making that considers multiple stakeholder perspectives.	Supports sustainable development by adapting to local needs. Promotes user engagement and local customisation. Increases the effective use of technologies.
Limitations	May require more extensive qualitative research to grasp the various enactments.	Potential over-reliance on the adaptive characteristics of technologies may lead to overlooking structural or systemic issues.
Application in Study	Zooming in on how the stakeholders have interacted with UAI throughout the Pilot Phase. Helps in identifying conflicts and synergies between various participatory planning practices in the city government.	Assessing the adaptability of UAI in diverse participatory settings. Evaluating the capacity of fluid technologies to meet the changing demands of participatory planning.
Potentials when Combining	Multiplicity can enhance the implementation of fluid technology by providing a richer context for its adaptation. Insights from multiple realities can guide more targeted and effective technological adaptations.	Fluid technology can support the operationalisation of multiplicity by providing concepts/tools that adapt to the multiple realities identified through ontological analyses.

Table 1, Ontological Multiplicity and Fluid Technology (own production)

With this table, we hope to show how the two concepts differentiate and how they might interact and support each other in the context of urban planning. For instance, understanding the multiple realities of the city officials (ontological multiplicity) can inform the development and adoption of more adaptable participatory planning technologies (fluid technology), ensuring they are effectively tailored to meet the diverse needs and situations in a city government.

Investigating the multiple ontologies of UAI in the city government is for us directly connected to the investigation of how UAI exhibits fluid characteristics, which is why we

have chosen to address both the ontological multiplicity and the fluidity together in the analysis. To ensure the presence of the goals and aims of participatory planning practices, as understood through CPT, we are, additionally, interpreting the empirical data through the keywords: dialogue, mutual learning, consensus-building and deliberation.

We are doing this under the following themes - ontologies - which we have seen enacted through the empirical data:

- **A Visualisation Tool for Communication**
- **A Commercial Digital Tool**

3.3 Methodology

This methodology section shares the reasoning for why we are carrying out a case study research, how the methods employed for producing the empirical data and analysis integrate with the theoretical framework, and lastly how we are positioning ourselves in the study together with ethical considerations.

3.3.1 Research Approach

In our study of UAI, we have performed a case study research approach. This methodology is particularly suited for in-depth exploration and description of contemporary phenomena within their real-life context, a framework strongly advocated by Robert K. Yin in his influential work, *Case Study Research and Applications: Design and Methods*. According to Yin (2018), case study research is most appropriate under these three specific conditions: 1) when research questions are exploratory - 'how' or 'why', 2) when the researcher has little control over behavioural events, and 3) when there is a need to cover contextual conditions because they are relevant to the phenomenon being studied (Yin, 2018, p. 9).

Our exploration of UAI in the city government aligns well with these conditions. The research questions we pose seek to understand how UAI is adopted into the participatory planning processes and how it affects these processes in particular ways, which require a deepening into the context of the different situations, thereby, fulfilling the first and third criterion. Additionally, the fact that we are exploring workshop situations retrospectively means we do not have influence on these events, fulfilling the second criterion from Yin (2018).

Case study methodologies are frequently utilised within techno-anthropology[13] due to their effectiveness in examining socio-technical interactions and multiple realities, fundamental aspects of ontological multiplicity (Gad & Jensen, 2010; Mol, 2002). This method allows for a nuanced understanding of how digital tools like UAI operate within and transform municipal planning practices.

[13] Examples are (Andersson, 2013; Børsen, 2022; Jensen, 2013)

By situating our research within this methodological framework, we align our thesis study with the traditions of both the field of techno-anthropology and the theoretical underpinnings of our study, enabling a thorough and contextual exploration of UAI.

3.3.2 Justification of Methods

As Figure 12 shows, we have combined a variety of qualitative methods to study the Pilot Phase of UAI in the city government. These are semi-structured interviews, participant observations and analysis of documents and pre-existing material.

Our empirical data produced through semi-structured interviews aligns with CPT's emphasis on communicative processes and stakeholder engagement in urban planning (Healey, 2012). CPT highlights the need for pursuing diverse stakeholder voices to understand the processes within planning practices (Healey, 2012). These interviews allow us to gather insights into how the stakeholders understand and interact with UAI, providing understanding to the actions and decisions that shape participatory planning practices in the city government.

Furthermore, the theoretical lens of ontological multiplicity, which claims the co-existence of multiple realities (Mol, 2002), guides our use of semi-structured interviews to capture these varied realities as enacted by different stakeholders. Each interview helps in understanding the different ways UAI is practised and understood within the planning processes, reflecting the multiplicity of experiences and phenomena.

Analysis of documents and pre-existing material complements this by providing a perspective on the use of UAI within the city's planning infrastructure. Reviewing planning and strategy documents allow us to trace how the technology is discussed and represented across different official channels, as a way for us to contextualise the multiple realities revealed in the interviews ensuring triangulation. By integrating document analysis into our research framework, we ensured that our study not only captured the human dimensions of technology integration but also recognised the significant role played by strategic documents - the non-human actors. This approach underscored the complexity of the socio-technical landscape in which UAI operates, providing a richer, more nuanced analysis of its impacts and implications.

The lens of fluid technology also justifies our methodological choices. By examining how stakeholders describe their use of UAI in interviews we assess the technology's adaptability and responsiveness to the needs of the city government's participatory planning environment. In combination with interviews and informal communications with the UAI co-founder, we have gained insights into the UAI team's approach for developing the tool based on their partners' local situations.

Finally, participant observations, where we interact directly with the UAI platform, have provided us with firsthand insights into the tool's functionality. This method not only enhances our understanding of the technology's usability and adaptability but also serves as a practical exploration of fluid technology by experiencing how the platform responds to user interactions in real-time.

Together, these methods - supported by the theoretical framework of CPT, ontological multiplicity, and fluid technology - form a strong strategy for the production of empirical data for this research. They provide diverse data sources and each method contributes to our understanding of how UAI influences and is influenced by the planning processes in the city government, providing a sound dataset for our analysis.

3.3.3 Analytical Approach

The foundation of our analytical approach was laid through a review of the theoretical landscape, an in-depth case study exploration, and a thorough literature review concerning participation, planning and digital tools. This phase shaped our understanding and prepared us for a nuanced analysis of the data. For the analysis, we consciously chose to embrace an inductive attitude inspired by thematic coding (M.Given, 2008; Yin, 2018). Thereby, we generated codes and notes directly from the data, ensuring that our interpretations were grounded in the empirical evidence. We read through the transcripts from our interviews, extracting codes relevant to our research questions that arose from the data - allowing the data to speak for itself. These were noted down in a Miro[14] board.

[14] A digital collaboration platform designed to facilitate remote and distributed team communication and project management - see www.miro.com.

Following this initial coding phase, we revisited our theoretical frameworks - CPT, ontological multiplicity, and fluid technology - to guide the reorganisation and refinement of the codes into coherent themes. The themes were specifically shaped to reflect the multiple realities uncovered in the interviews and analysis of documents and pre-existing material and to discuss the fluid qualities of UAI, thereby, ensuring that our analysis was both empirically robust and theoretically informed. The initial themes deriving from our analytical work in the Miro board were 'Useful Collaboration Tool', 'A Digital Burden' and 'Deceptively Simple'. These themes were further reworked during the writing phase of the analysis resulting in two final themes: 'A Visualisation Tool for Communication' and 'A Commercial Digital Tool', with which we have organised the data in its written format.

This approach not only followed the inductive character of our research but also ensured that our findings were deeply integrated with our theoretical frameworks. The alignment with CPT helped us focus on the communicative aspects of UAI's use, ontological multiplicity allowed us to appreciate the coexistence of multiple realities, and fluid technology guided our analysis of the technology's flexibility and responsiveness within these realities.

It is important to note that our engagement with the empirical data was guided by analytical considerations through all stages: ongoing reflections and discussions of an analytical nature were a constant part of our research process.

3.3.4 Positioning Ourselves

Our engagement with the case study of UAI in the the city government is informed by two primary relationships: 1) a five-month internship with the UAI team, including participation in a key preparatory meeting for the Street Redesign Workshop, and 2) personal acquaintances within the SMO, with two among our informants. These connections provided privileged access to valuable insights and stakeholders, shaping our research design significantly.

We maintained professional boundaries throughout the thesis research, limiting our interactions with the UAI team and SMO staff to scheduled academic interviews to mitigate any potential biases. Additionally, the interviews with the two members of the SMO, whom one of the authors is personally acquainted with, was led by the other author to best ensure

professional boundaries. The dual perspective of having one author being local (based in the same city) and another from outside the region enriched our approach, ensuring a balanced exploration of the urban context - integrating deep local understanding with a fresh external viewpoint.

Ethically, our research posed interesting challenges language-wise. Conducting interviews in English, which is neither the informants' nor the authors' first language, required careful consideration. Interpretation of data and the communication in the interviews can be challenged when both interviewee and interviewer are forced to express themselves in a language other than their native language (Choi et al., 2012). Therefore, we have made sure to ask clarifying questions during the interviews to ensure correct understanding of their experiences. We in addition offered interviews in the native language to facilitate comfort, which, although declined, showed our commitment to ethical clarity and understanding. The use of Google Chrome's translation feature (Coyle, 2023) for documents, critically reviewed by our native-speaking author, was essential for inclusive data access but was approached with caution to account for any linguistic discrepancies.

The UAI tool uses text-to-image technology which forms a foundational aspect of the platform. However, our research primarily examines the application of the tool within participatory planning contexts, rather than focusing on AI technology itself. We acknowledge the potential ethical concerns that arise with the use of AI technologies, particularly the risks concerned with data biases which may potentially impact the decisions made during participatory planning processes. Although our informants did not raise specific concerns regarding AI biases, we recognise the importance of addressing these issues in the broader scope of AI ethics. Future research might explore the specific implications of AI technologies in urban planning, particularly investigating how biases embedded in AI models could impact inclusivity and the diversity of planning outcomes. Such studies would further contribute to a nuanced understanding of AI's role in shaping urban spaces.

By acknowledging these complexities and actively managing them, we aimed to uphold the integrity of our research and ensure that our findings are both robust and ethically sound.

3.4 Methods

To ensure transparency and replicability of our research, we will now go through our process of how we have produced the empirical data for this thesis study. The methods employed were semi-structured interviews, participant observations, and analysis of documents and pre-existing materials, with a continuous review of the literature in the intersection of planning, participation and digital tools.

3.4.1 Literature Review

To understand the field with which we are interacting, we conducted a literature review, which has informed the theoretical framework, the methodological choices and the research angle for this thesis. The offset was a review on the scientific contributions on participatory planning practices and digital tools for participation based on keywords informed by our previous projects in the similar fields. This was coupled with snowballing, a method where one tracks down related works through the references of an article, together with the revelation of, for us, new keywords and important works. Seeing as we have now entered into a time where, as is also illustrated with this case study, technologies utilising AI are gaining a lot of traction in very many different arenas, academic works are no exception. We have made use of the generative AI web app, ChatGPT, as a discussion partner in our search for the literature relevant to the field of study to generate new keywords and approach the literature search in a novel way[15]. It should be said that we have cross-checked whatever ideas or suggestions in terms of literature ChatGPT might have brought out in any of the commonly used scientific databases (Scopus, Google Scholar and Science Direct), as is good practice in every instance of searching for and selecting relevant literature.

The keywords used to retrieve the literature were many and they were tried in different combinations: Participation, Participatory planning, Communicative planning, Planning, Citizen participation, Public participation, Public engagement, Digital tools, Digital participatory tools, Digital tools for participation, 3D visualisation, Generative participatory AI, Text-to-image, AI image generator, Artificial intelligence, Urban, Urban planning, Adoption of digital tools, Municipality, Local government, Planner.

[15] This is within the AAU guidelines of use of generative AI as found in the Semester Description for Master's Programme in Techno-Anthropology CPH, 4th Semester Spring 2024.

3.4.2 Overview of Empirical Data

The Figures 13A and 13B provides an overview of the entire pool of empirical data. Figure 13A presenting the data produced and selected for the thesis, and the Figure 13B showing data produced in a previous semester project, yet which has been found to add significant value to the interpretation and description of the Pilot Phase.

Figures 13A & 13B, Overview of Empirical Data (own production)

3.4.3 Semi-Structured Interviews

To ensure the integrity of our empirical data, we used a detailed methodological approach for conducting semi-structured interviews. Inspired by Knott et al. (2022), our interviews were designed to go deeply into the experiences and perceptions of stakeholders involved with the

UAI platform within the city government. In all of the 13 interviews, apart from two, both authors were present with one having the role of main interviewer and the other secondary interviewer to ensure a smooth flow throughout the interview.

Informant Selection

We strategically chose participants who had direct experience with UAI, starting with known stakeholders from the Street Redesign Workshop. The selection process expanded through snowball sampling (Knott et al., 2022), where interviewees recommended other potential informants, ensuring a diverse array of insights into UAI's application in participatory planning in the city government. Table 2 provides an overview of the semi-structured interviews conducted for the current research as well as the ones conducted for the study in the previous semester, which we found reasonable to include in the current study following our criteria for selection.

Name	Department & Role	Relation to UAI	Empirical Data
John	SMO, Strategic Planning Services & Spatial Planning and Design Department, Architect-Planner	Used UAI in a workshop for the Youth Forum Trained colleagues in the use of UAI	2 x semi-structured interviews for the current study.
Lisa	SMO, Strategic Planning Services, Spatial Planning and Design Department, Architect-Planner Former Participation Specialist in the City.	Used UAI in a workshop for the Youth Forum and in the Street Redesign Workshop	1 Semi-Structured interview for previous study 1 semi-structured interview for the current study.
Joan	SMO, Strategic Planning Services, Spatial Planning and Design Department, Head of Unit	Part of the planning of the Street Redesign Workshop. Participated in the same planning meeting as the two authors with UAI in the fall of 2023.	1 semi-structured interview for the current study.
Ida	Urban Environment and Public Works Department, Project Manager, Participation Specialist	Her department was mentioned several times as one that could make use of UAI, but so far they have not.	1 semi-structured interview for the current study.
Brian	SMO, IT Department, Digital Twin Project Manager	Has technical insight into the technologies used in SMO.	1 in-person semi-structured interview together with Eva in the participation hub for the current study.

Eva	Urban Planning Department, Development Unit, Participation Hub Curator	The participation hub was mentioned as a place where to engage with citizens through UAI. Has participated in a workshop using UAI which was not facilitated by the city government.	1 in-person semi-structured interview together with Brian in the participation hub for the current study.
Michael	Head of Digital Construction in SMO + BIM Project Manager in Ministry of Climate	Decision-maker behind purchasing and renewing the licence of UAI.	1 semi-structured interview for the current study.
Karen	Senior Specialist of International Youth Work in the Education Department	Has used UAI in her practice with youth after observing the Youth Forum workshop.	1 semi-structured interview for the current study.
Lorenz	Co-Founder of UAI	Co-founder of UAI and the contact for the city government Consulted and facilitated the Street Redesign workshop together with members from the city government.	1 semi-structured interview for the current study. Several informal meetings during the authors' internship in the fall of 2023.
Mina	Urban Studies researcher at a University in a Northern European city	Designed and facilitated 3 UAI workshops for research in a Northern European municipality. Not part of the Pilot Phase.	1 semi-structured interview for previous study.
Christian	Architect in the Northern part of city	Has facilitated a UAI workshop for another UAI partner. Not part of the Pilot Phase.	1 Semi-Structured interview for previous study

Table 2, Overview of Informants and Interviews (own production)

For each of the interviews, we created an interview guide which was rather structured but our use of it was flexible, and aimed at revealing details about the use of UAI as experienced by the informant. Although we had in a detailed way prepared for articulation of some of our questions, we still only used them as guidelines for the interview and were at any time ready to go "off script", to follow the story as expressed by the informant. The guide, which was developed collaboratively between the two authors, included questions about the participants' roles in the city government, their daily engagement with participatory planning, and specific interactions with UAI. We refined our interview questions iteratively, tailoring them to better fit the evolving context of our research and deeper insights gained from ongoing data analysis - see Appendix A for an example of an interview guide.

Ethical Considerations

Before each interview, participants were informed about the study's purpose and assured of their anonymity in any published work. To establish anonymity we have changed every informant's name. We have also chosen to keep the actual location of the case study hidden from the reader, allowing us to still share the informants' roles and positions in the city government without compromising them. Following this, we have not attached the transcripts from the interviews as there are many aspects of our discussions that would disclose the case city. We obtained oral consent for recording the interviews, ensuring participants were comfortable and understood their rights, including the ability to withdraw any part of their statements at any time.

To prepare the interview data for analysis, we used notta.ai[16] for initial transcription, followed by proof-reading to correct any discrepancies while still keeping the authenticity of the dialogue[17]. Minor grammatical changes were made to enhance readability without altering the meaning of the responses.

3.4.4 Participant Observation

As part of our research methodology, participant observation played a big role in supporting our understanding of the UAI platform (Flick, 2022). During our internship with the UAI team in the Fall of 2023, we actively engaged with the tool in a variety of settings. This involvement provided us with valuable firsthand insights into the functionality and usability of the platform.

Our direct interaction with UAI occurred during a boot camp organised for another Northern European municipality. Observing UAI’s introduction and application in a training session similar to the one conducted for the city government allowed us to contextualise the platform’s utility and adaptability enhancing our understanding of its potential impact and versatility.

Further deepening our engagement, we had individual access to the UAI platform, where we experimented with its various features including the white canvas concept generation, the

[16] notta.ai is a tool powered by ai that used to convert audio to text.
[17] If you are interested in seeing these transcripts, please contact the researchers.

situated image concept generation, and different prompt development strategies. These activities enabled us to personally experience the platform's responses to diverse user inputs and scenarios, simulating potential real-world applications.

Although we did not witness UAI's application in the city government's workshop settings directly due to scheduling constraints and a limited number of conducted workshops during our research period, our participant observations significantly influenced our research approach. The insights gained from actively using UAI informed the development of our interview guides and enriched our interpretation of interview data. While these observations were not recorded as empirical data, they shaped our analytical perspectives and enhanced our understanding of the platform's impact.

3.4.5 Document Analysis

The third method we have applied is an analysis of documents and pre-existing materials. The method has played a critical role in both contextualising the realities shared during interviews and triangulating the data produced through the various methods. This approach not only enriched our understanding but also ensured the robustness of our findings (Morgan, 2022).

We used a document tracing strategy, where official documents mentioned by the interviewees were subsequently located and analysed. This approach allowed us to engage with these documents as non-human actors within the UAI network, exploring their interactions with human actors and their influence on the implementation processes. For instance, the city government's 2035 development strategy was included to understand its alignment with stakeholder perceptions about participatory urban planning and role of technology. Additional materials such as promotional videos, online news articles, and workshop presentations accessed during our internship at UAI provided further context. These materials further helped us triangulate the information from interviews, offering alternative perspectives and confirming or questioning the insights gained from direct interactions with stakeholders. The access to workshop materials developed and presented by UAI team members for the Street Redesign Workshop as well as the analysis of media and newspaper articles further enhanced the contextualisation.

The process of selecting the documents and other pre-existing material followed the four factors as presented in Hani Morgan's article "Conducting Qualitative Document Analysis": authenticity, credibility, representativeness, and meaning (Morgan, 2022). In Figure 14, we have illustrated how we have adapted them to our case study accordingly. These have been considered in every assessment of documents or pre-existing material we have encountered throughout the thesis study before deciding to include or exclude them.

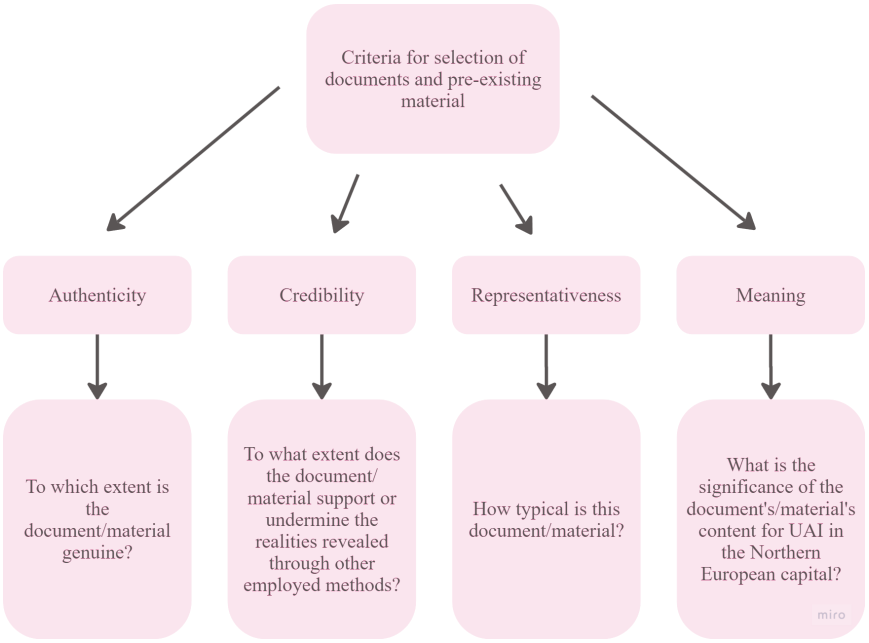


Figure 14, Criteria for Selection of Documents and Pre-existing Material (Adapted from (Morgan, 2022))

The insights from the documents and materials were handled similarly to the insights derived from participant observations. Although not recorded as direct empirical data, they shaped our interview guides, allowing us to ask more informed questions and go deeper into the realities expressed by informants, thereby influencing our analytical process, and contributing to our understanding of how UAI affects participatory planning practices in the city government.

Here we end with Chapter 3. Thus far, we have provided the reader with an overview of the research in the intersection of planning, participation and digital tools, the case context revolving the Pilot Phase of UAI in a Northern European city government, our research approach and the decisions for chosen methods. In the upcoming chapter, we will share our empirical findings and analysis.

CHAPTER 4

4.1 Empirical Findings

This section presents the analysis of the study based on the gathered empirical data and research design. The analysis aims to answer the following research questions:

How can the Pilot Phase of UrbanistAI in a Northern European city government help understand the challenges of adopting 3D visualisation tools for participatory planning in municipalities?

> How are the challenges of participatory planning addressed with UrbanistAI?
>
> How might the conceptualisation of UrbanistAI as a fluid technology provide insights to inform decision-making?

We will first present a summary of selected observations that will be further examined in the analysis body below.

The Street Redesign Workshop

The choice to use UAI for the Street Redesign Workshop came about to find a solution to gather expert and local stakeholder knowledge within a tight deadline, illustrating how the practitioners are equally balancing between the swift and slow approach as the planners in Calderon's study (Calderon et al., 2024). Ideally, they would have preferred an architectural competition or to create design proposals themselves within the Spatial Planning department. However, due to the political decision to allocate funds within a specific timeframe, they decided on a workshop using UAI as a last option, yet it was generally agreed within the city government that the workshop was a success.

Contradicting Viewpoints of the Initiation of the Pilot Phase

There are conflicting viewpoints among the city government employees regarding the initiation of the UAI Pilot Phase. According to the Head of Digital Services, the Pilot Phase was agreed on with the UAI founder from January to June based on the requests from the Spatial Department of SMO and the Zoning Department of Urban Planning. However, the Head of the Spatial Department of SMO did not see the need for a Pilot Phase, supporting its

use in the Street Redesign Workshop but not beyond. The Zoning Department Head, who shared their viewpoint through the Participation Hub Curator, whom we interviewed, indicated they have found no use for the UAI tool within their department. This discrepancy suggests a gap between decision-making and the intended users of the tool, with the Spatial Department not acknowledging having made a request for the Pilot Phase, thus not feeling responsible for determining the tool's integration into their practices.

Adoption of the Tool

The Head of Digital Services envisions the UAI platform being used across all departments involved with participatory planning, yet by the time of the interview (end of April), no specific attempts to introduce the tool to other departments besides the Spatial Planning department at SMO had taken place. Additionally, no training or guidelines for using the tool had been shared. Rather, it was expected that the tool could be adopted organically by the practitioners taking initiative. Within the departments related to spatial planning, the architect-planners from the Spatial Planning at SMO carried out a Youth Forum workshop, and one of them, who is also responsible for tactical urbanism projects, considered the use of the tool in June, yet decided to postpone the workshop. They are also the only one of our interviewed stakeholders who perceive UAI as part of their toolbox, open to using it when they find appropriate. The Urban Development Department had not found use for the UAI platform. The Urban Environment & Public Works Department had not used the tool at the time of the interview, although they had heard of it. We did not have any contact with the Transport Department, yet to our knowledge, the tool has not been used there. The Education Department showed interest based on the Youth Forum, and received a brief training from an architect-planner involved in the event. However, upon attempting to use the tool in a workshop, it did not work, which we will elaborate on below. The representative from the Education Department who we talked to felt they would need more training to use the tool further. In general, this shows that the tool has not been widely adopted, while it has been used in a selection of workshops for educational purposes.

Use in Educational Workshops

During the Pilot Phase, UAI was used in two workshops to engage with school and university students. One workshop was a collaboration between SMO Spatial Planning and the

Education Department for the Youth Forum (YF). It was facilitated by two architect-planners from the SMO Spatial Planning Department who had both participated in the UAI bootcamps and one of them had moderated a group in the Street Redesign Workshop. This YF workshop sparked the Education Department's interest in further use of the tool, and one of the architect-planners carried out a quick tutorial for them using the tool. However, when the Education Department attempted to use the UAI platform independently, they faced difficulties. The other workshop, facilitated by the Head of Digital Services, introduced the tool to Dutch university students visiting the city government.

Technical and Practical Challenges

The city government received two UAI licences: one intended for the Participation Hub to facilitate workshops and the other for practitioners to experiment with the tool. A Microsoft Teams group chat was created to notify others when the tool was being used. As the UAI founder informed us, the licences had significant differences in server power, impacting the speed of image generation, so the licence intended for workshops was considerably faster and using the licences on multiple computers would slow down the tool significantly. However, this information was not widely known, leading to issues such as the Education Department dropping the tool mid-workshop due to its slowness and switching to drawing instead.

Summary of Observations

While UAI has been used for educational purposes, it has not been used as a part of a planning process like the Street Redesign Workshop was. The differences in perceiving and adopting the tool within the city government highlight the challenges in applying new technologies in municipalities. We will now further analyse these observations.

4.2 Analysis

> *We end our licence at the end of June, and then I will do the evaluation: if it was used enough, and would it make sense to renew it? And if it was not used enough, why was it not used enough? Is it a matter of the technology itself, or is it somehow the matter of people being too occupied with their everyday work, or do they just not believe in participatory urban planning? It's this… It's what I want to find out from that [evaluation], before just randomly renewing the licence. (Michael, personal communication, 26 April 2024)*

Quest, question. It is said to be of no coincidence that these words share the same core. A question (or questions) sets one down a dedicated path. In research, questions are decisive; they drive our study and shape our attention. While the Head of Digital Construction in the city government may pose questions about purchasing a licence for UAI in a straightforward pro-and-con manner, our exploration reveals a more intricate landscape.

UAI, during its introduction to the city government, moved around in a manner similar to an unexpected guest. Sometimes it was a visitor not initially invited but warmly accepted. Other times, it felt like an intriguing acquaintance who had made a great first impression yet struggled to communicate. Occasionally, it was a mysterious being, rumoured to have potential, yet its charm remained ambiguous. This dynamic interaction makes it challenging to determine whether the city government should continue using UAI in its practices.

This question of continuation, however, is not the one we set out to answer. We argue that it is impossible to evaluate a tool before it has been more thoroughly understood. Our goal is to open up the understanding of UAI, and by doing so, we hope to contribute to a more nuanced conceptualisation of what UAI is and what it means to be integrated into urban planning practices.

4.2.1 A Visualisation Tool for Communication

A visualisation tool for communication is inherently a hybrid, as it uses one activity to achieve another - using visualisations to communicate and conversely, the vice versa is also true for UAI - communicating to create visualisations. These features are intertwined within the use of UAI in a workshop setting, where communication and visualisation continually interchange their roles. The facilitator of another UAI workshop than those included in the

Pilot Phase noted this occurred because of a constant feedback loop - the generated images are not necessarily design solutions, but act as prompts for discussions, and the communication between the participants in turn serves here as 'designing' by agreeing on the textual prompts. Therefore, the process involves an ongoing movement from one activity to another, with each shifting the roles they fulfil. This shows a challenge in separating these roles and viewing the tool exclusively as either a communication or a design tool. This way of being illustrates the fluidity of the UAI tool on how its functions adapt to various roles.

Why is it important to acknowledge whether the UAI platform is emphasised more as a design tool than a communication tool or vice versa? We found that at times these functions supported each other, yet at other times, these functions may create tensions between them. The emphasis on one function over the other significantly impacts how the tool is used. In some cases, prioritising design over communication resulted in confusion, and in one case, even conflict. We will further examine the push-and-pull effect between these two functions.

Complementary Roles

The city government practitioners agreed that the most valuable aspect of UAI was how it supported discussions and engagement among stakeholders with diverse backgrounds. The Head of Spatial Planning at SMO expressed:

> *I think UrbanistAI was very good for allowing other stakeholder groups to be heard and design space. What I really like about this program is the fact that it's so primitive in these visualisations that you can create. So that everyone understands that the visual that you get from the AI program is not the end result. The fact that it is so limited of what it can design is kind of a virtue for it right now because if we had designed this space using traditional architect tools then some stakeholder groups would have assumed - especially those who weren't included in this process - that this is what the street is going to look like, but it was not our aim to design the street but to find the qualities and spark discussion of how to even assess this street. (Joan, personal communication, 11 April 2024)*

This statement reveals a few key insights. It illustrates how the abstract nature of the images supports the discussion rather than figuring out the details of the design. Also, the ability to generate images in the workshop keeps the discussion open. Another architect-planner from SMO Spatial Planning Department also emphasised that the images were central for

maintaining a balanced discussion, preventing it from becoming too vague, which also demonstrates how the images act as a guidance for dialogue. As they noted:

> *If you want to have a more meaningful discussion, then you should bring something to the table - have some image or illustration. So you usually do it beforehand on your own. It takes some time and you already have to make a design decision. The difficult thing is how to make it in a way that people would understand that it's not something that's already decided and it's still an open discussion. With UrbanistAI or similar tools it is good that you start a discussion and then you create the image together and then you still have something concrete to discuss whether you like the things you're seeing or not. (John, personal communication, 15 March 2024)*

Furthermore, some facilitators used the features of the image generation and the generated images to their advantage to lead the discussions beyond their usual territories. When the images did not depict what participants expected to see, this aspect was embraced to deliberately try out unexpected ideas. For example, in another UAI workshop not included in the Pilot Phase, one of the generated images illustrated a flooded street, which prompted discussions related to environmental impact and climate change as is shown in Figure 15.

> *There were definitely certain things that didn't come out correctly, and that was actually interesting, because it also pushed the conversation… you can go out of the box, push crazy ideas and see how they look. (Christian, personal communication, 21 November 2023)*

Figure 15, UAI Generated Image From Workshop (Not Included in the Pilot Phase)

Using visuals as symbols rather than for design purposes also occurred in the Street Redesign Workshop, where participants began using animals to represent qualities they envisioned for the street. This approach was possible because the image generation happened immediately, which would not have been possible with the regular design tools architect-planners use. As the workshop facilitator noted:

> *At first, we were trying to be conventional and then pretty quickly we went over the top because this is something you wouldn't do with your regular tools when you're rendering or using Photoshop. You usually don't put silly animals in the images because you're spending so many hours doing it but when it's quick and you can play around... I think that was the fun part …*
>
> *It was not only fun, but we used those ideas to bring out feelings we wanted to have on the street. For example, to give the feeling that this street can be this peaceful that even sheep can eat there. (Lisa, personal communication, 28 November 2023)*

The statements also demonstrate how creating the visuals supported communication by providing an enjoyable activity that contributed to a positive atmosphere, which is essential for supporting dialogue and collaboration. The way visuals may support communication is especially apparent in the impression of the Participation Hub curator, who was a participant in another UAI workshop than those included in the Pilot Phase.

> *When we were talking, it felt that everybody wanted something different, and explained it in its own way. And when we were choosing pictures it kind of helped overcome these barriers and show that sometimes we tend to hide the meanings behind the words, but we have a common understanding of a nice common space. (Eva & Brian, personal communication, 11 April 2024)*

These examples show that the UAI platform used in a workshop may adapt well in various ways: levelling various stakeholders, generating images to keep the discussion open, depicting various scenarios to spark discussion in unexpected ways, and the images building consensus among the workshop participants. All of these elements are central to Communicative Planning Theory (CPT). These examples also show how the UAI tool adapts to various ways the visualisation and communication features may be used, illustrating its fluidity. Thus far, we have demonstrated how visualisation and communication act as complementary roles, however, these same functions can also create tension, which we will now explore.

Contradicting Roles

While the UAI platform worked well in levelling stakeholders in the Street Redesign workshop, then in the Youth Forum, for some students it was not as easy to use the tool. In the case of Street Redesign, the participants were predominantly urban experts already familiar with spatial design vocabulary. In contrast, during the Youth Forum workshop, for the youth participating in the workshop, the expressions did not come as naturally, and there was less understanding that the visuals represented concepts.

> *There was a barrier that they didn't know how to describe their ideas as it was with the [Street Redesign] workshop. So they [Youth Forum workshop participants] told me the idea and I had to translate it. And maybe sometimes I understood it, or [sometimes] didn't understand it. So they saw the image and they're like, "oh, that's not what we meant." So we had to find new words or phrases. (Lisa, personal communication, 5 April 2024)*

It shows that while the UAI tool is seemingly accessible for anyone to generate images with textual input, then having no background in creating spatial solutions might still make it challenging to express oneself. This confirms the literature of text-to-image tools on how creative professionals approach the tool differently - having expert knowledge in the field plays a role in how the tool is used. This also shows the importance of the facilitator supporting the participants in expressing themselves with spatial vocabulary to create better prompts. The facilitator in turn learns from the participants what they would like to experience in urban space, making it a space for mutual learning, another aspect important within CPT. Evidently, bridging the gap for providing the spatial vocabulary is only possible in case the facilitators themselves are versed in offering this expertise. However, not all participation specialists are also spatial planning experts, and it is naturally unrealistic to expect them to be.

The UAI tool intentionally generates images that are not perfectly photorealistic. As the UAI founder shared with us, this is not the intended goal of the tool. However, interpreting these images solely as concepts may not be straightforward for everyone. There is also a delicate balance between what is considered abstract and what approaches photorealism, with the images generated by UAI walking a fine line between the two. In the case of the Street Redesign Workshop, there was a clear understanding that the images served as concepts.

However, in the Youth Forum, this understanding was not as evident among the young participants:

> *Students were a bit more critical of the tool, so they expressed more that this was not the design they had in mind… They took it a bit too literally initially, but we discussed it with them, and then I think it was smoother. (Lisa, personal communication, 5 April 2024)*

Therefore in one workshop with certain facilitators and participants, it may be clear that images represent concepts, yet this may not be the case for all workshops with different facilitators and participants. Interpretation of the visuals is influenced by both participant's and facilitator's background. While it may be possible to predict the participants' and facilitator's approach based on their profiles, this enactment only unfolds within the workshop setting itself, adding another layer of uncertainty to the already complex process of conducting participatory planning workshops. In the Youth Forum workshop, the facilitators guided the participants through discussions to focus on ideas, and not specific design solutions. Therefore they addressed the confusion the participants had during the workshop, and the participants adjusted their approach based on their guidance. Thus the facilitator played a key role in how the participants perceived the tool. This enactment equally demonstrates the fluidity of the tool. While participants understanding the images as concepts was shaped by the facilitators, there was nothing within the features of UAI that objected to the facilitators being able to guide this perception.

While the confusion in the Youth Forum workshop seemed subtle, if not addressed, it could lead to a dissatisfying workshop experience. This happened in one of the workshops with a Urban Studies researcher from a Northern European university, where the focus on creating detailed designs resulted in participants concentrating more on getting a 'right' image rather than discussing ideas. The university facilitator shared that:

> *The UAI was not good. We didn't know how to use it properly. The girls hadn't trained enough or something went wrong. It was not good at all… people were like, no, no, no, not like that, I don't want it like that. People take it too much as reality, you know. This is not a design tool. This is really a discussion tool. This is really hard for me to understand and for the participants as well. We cannot design… Even if we wanted, it doesn't create the pavement as we want. (Mina, personal communication, 12 December 2023)*

This experience also emphasises the importance of facilitation. An important aspect in adopting a tool across the city government are the training opportunities for learning to use the tool. For example, although an architect-planner gave a brief tutorial for using UAI to the representative from the Education Department, they still felt lacking preparation to carry out more workshops.

> *I would really like to [use UAI] but I lack the expertise right now. ... I need more training and then I can use it. (Karen, personal communication, 19 April 2024)*

It also suggests what seemed sufficient for learning to use the tool from the viewpoint of the architect-planner did not seem so to the practitioner without a background in spatial planning. This indicates that participation specialists may require more in-depth training to use the tool compared to those with spatial planning training. It would be useful for this difference in expertise to be accounted for in the training program for learning the tool and facilitating workshops using UAI. Additionally, there should be a general understanding that participation specialists might struggle more with the tool compared to architect–planners. Could these examples of people struggling to express their ideas be seen as an opportunity for the UAI team to improve the tool to better support and guide users in creating the prompts? For example, a further development to the existing prompt builder available to users, so the tool could essentially take on the role of a facilitator. One could argue that this change could improve the tool's fluidity to meet users' needs even better. However, such a change would require careful consideration for two reasons: 1) the tool is intended to support in-person interactions, so the role of the facilitator-expert should be valued, 2) this might shift the tool to be perceived more as a design tool as the focus would be brought to the visualisations.

Workshop Materials

The dynamics between visualisation and communication could also be influenced by the workshop material setup, particularly the number of computers participants have access to, which affects how much initiative they can take in the image generation process. As reflected by the architect-planner who facilitated workshops in both the Street Redesign Workshop and Youth Forum:

> *[The] Youth Forum was a quicker workshop and it was just me behind the computer writing the prompts. With the [Street Redesign] workshop, we had a few computers per group, so we could work at the same time, compare the results, and then discuss. So it was more a tool for discussion. But with the forum, it was more a tool for showing their ideas to the others in the final presentations. (Lisa, personal communication, 5 April 2024)*

While not necessarily a tension, this statement shows how the workshop materials equally influence whether the UAI tool is primarily used for discussion or image generation. The ability to enter prompts directly facilitated a more interactive workshop experience.

Thus far we have illustrated that in the enactments of UAI in workshops, tensions may arise between visualisation and communication, particularly when the visualisation feature receives more attention than communication. Additionally, the participants' backgrounds significantly influence their ability to perceive visuals as concepts and use spatial vocabulary, with facilitation playing a crucial role in shaping this dynamic.

While the supportive and contradictory roles we have outlined have been identified within the workshop setting, the interplay between communication and visualisation extends beyond workshops into the power dynamics among various stakeholders within the city government. We will explore this topic in more detail next.

Beyond the Workshop Setting - Communication and Visualisation Impacting Power Dynamics Between Stakeholders

All the informants we interviewed expressed an interest in involving the public more in the planning process, some of them also wishing for the public to be more vocal about issues in the city. As mentioned earlier, they appreciated the UAI platform supporting in levelling the various stakeholders, seeing it as a tool to bring in more voices. Some informants see the

public as potential allies in advocating for shared goals for a more sustainable city development, which are not always supported by the politicians in power. This shows an interesting power relationship which suggests the practitioners' views being shaped by CPT and liveable cities principles, whereas this may not be the case for the elected city officials. As the Head of the Spatial Planning Department shared:

> *When designing public spaces there are many city officials who think that architects are not needed - that designing a public space is the project for traffic engineers and then maybe later architects can join in and place some trees and benches. Our role as city architects is to make other parties understand that architects do have a very strong role in designing public spaces. When we talk about using AI for designing spaces, it can help to spark discussion. But there is also this threat that when AI becomes more advanced, then these other parties, who do not necessarily want to work with architects, say that architects are not needed - that we have this AI program who will design everything. That's why I'm a little bit hesitant in using and empowering these tools. I think these are amazing, but they have to be used very specifically. These tools cannot replace the architect's expertise. But when working with communities, the tools could become very handy. (Joan, personal communication, 11 April 2024)*

So a fear of AI tools being used primarily for design - thus potentially overriding the expertise of architects and planners - may not stem from a fear of giving the public more power. Instead, it might arise from a concern about being overridden by political forces within the city government. Thus, while using UAI within a workshop setting may be welcomed, uncertainty about how the narrative of the workshop and the images are used afterwards may create hesitancy in using the tool at all. It also illustrates a realisation for multiple ontologies emerging - a different version of what the tool is and what its purpose is forming in the heads of others that one feels they might not be able to control. Therefore, they might hesitate to use the tool according to their own view, as it still might lead to the spread and formation of other understandings of the tool that may start conflicting with their own version of the tool.

Another aspect impacting the power dynamics is that the most useful element in the workshop - the discussions - may remain 'invisible'. Indeed, within the workshop setting, UAI is practised as a communication tool, however, without people coming together, its role as a communication tool no longer exists. This does not mean the tool stops working because the tool can be used on an individual basis. Yet, the discussion element is 'invisible' within

the features of the platform itself, and might stay so after the workshop unless the facilitator takes the initiative, an extra step to document it. This was the case in the Street Redesign Workshop, where the facilitator used a Miro board to capture the discussion.

> *I did a Miro board for our discussion because I was certain that within a few weeks or even days, I would forget all about the discussions. And it was really helpful when we were writing the [procurement] conditions for the next step. Because some other teams, as I've heard from them, can't really remember what they were discussing. They put stickers on the papers, but you don't have it anymore. (Lisa, personal communication, 28 November 2023)*

The approach of the facilitator directly impacts how the outcomes of using UAI are perceived and used after the workshop. By documenting the discussion, the facilitator reinforces the understanding of UAI as a communication tool. However, if only the images remain as the workshop's outcome, those not present at the workshop may perceive UAI primarily as a visualisation tool. Advocating for or recognising the 'invisible' feature - one that exists only when enacted in a workshop setting with people coming together - becomes challenging especially for someone who has not experienced the workshop firsthand. This gap is especially apparent if the final images generated in the workshop do not necessarily illustrate what participants had in mind. As one of the workshop leaders from another UAI workshop than those included in the Pilot Phase shared:

> *I'm not really happy with the final image but the process in getting there was meaningful. (Christian, personal communication, 21 November 2023)*

If the images are intended as input for the next steps in an urban planning process, then they can be misleading without the additional context provided by a facilitator or a workshop participant. This issue came up for the Spatial Planning team when they were developing the procurement requirements based on the Street Redesign Workshop, and were struggling in making the invisible (the discussion) visible and making sure the images would not be perceived as solutions. While they finally did choose to include the generated images (alongside a contextualising description) to the procurement requirements, then this was not an easy decision.

> *We were discussing it in a few meetings whether we should include those images or not. Whether we should only take out written ideas that came up in the workshop or whether we should illustrate them as well. In the end, we went with having illustrations but having a text next to it to actually describe what are the important aspects of this image and what are the things we are not content with. So it wouldn't be something that someone would be too inspired by. (Lisa, personal communication, 5 April 2024)*

The need for making the 'invisible' visible also highlights a shortcoming within the UAI platform, and where we find the limits of fluidity in the platform. Integrating a feature to document the discussion within the platform would not only emphasise the importance of dialogue but also allow the tool to better fulfil its communication function.

Here we conclude the first part of the analysis, where we have demonstrated how the UAI platform's functions of visualisation and communication can both support and contradict each other's roles within and beyond the workshop setting. We have observed the fluidity of the tool in its enactment of these dual functions, which are significantly influenced by the facilitator's role, the workshop participants, and the workshop setup. We will now turn our focus to UAI as a commercial digital tool, which similarly includes tensions within its various enactments.

4.2.2 A Commercial Digital Tool

We find UAI can be categorised as a commercial digital tool because it requires a paid licence to use the tool. Being both a digital tool and a commercial product creates a dynamic in which these aspects sometimes support, and at other times limit the tool's adoption. Rather than examining digital and commercial aspects separately, we find them so intertwined that we will explore them together, while occasionally focusing on them individually.

Supporting Adoption

One key factor in the adoption of tools is the willingness of participatory planning practitioners to use them. In the Northern European capital, the practitioners generally have a positive attitude towards technology. They find digital tools can open up possibilities for collecting data and interacting with the public in ways they have not practised before, even if they lack beneficial examples to draw inspiration from. Furthermore, Michael, the Head of

Digital Construction and equally the decision-maker behind renewing the licence for UAI (and other digital tools), finds it important to support participatory planning in the early stages of an urban planning project, therefore is a firm believer in the purpose of the tool (Michael, personal communication, 26 April 2024). Moreover, according to Michael, the city government has enough funds available to purchase a licence if they wish to do so. This is likely also because the city's 2035 Strategy highlights the use of (innovative) digital solutions within the city's services.

Michael also advocates for the approach of "analyse→prototype→pilot" for implementing digital technologies, meaning the city government tries out a new technology on a smaller scale before making a larger purchasing decision (Michael, personal communication, 26 April 2024). This way they try to ensure the licences which are bought will find use. For the UAI tool, the prototype was the successful Street Redesign Workshop, and the pilot period is the licence from January to June. Furthermore, as the UAI founder shared, the city government practitioners would potentially have the possibility to influence the tool's development process by providing feedback, as the UAI team is interested in a collaboration (Lorenz, personal communication, 3 May 2024).

While these aspects suggest an interest from the city government's side for a successful adoption of the UAI tool, the fact that it has not found widespread adoption indicates that there are underlying limiting factors, which we will now delve deeper into.

Limiting Adoption

The city government, like any municipality, follows laws governing the purchase of tools to ensure transparency and responsible public spending. While the UAI Pilot Phase licence was acquired without a formal procurement process, a future purchase would need a procurement, to ensure fair competition for similar tools to be submitted for consideration. This requirement influences not only the bureaucratic process of purchasing tools but also the mindset towards tools in general. Practitioners need to remain open to adapting to similar alternatives rather than committing to a specific tool. How this aspect shapes the perceptions around UAI is articulated well by the Head of Spatial Planning at SMO:

> *I don't think that a public organisation, which the city [...] is, should stick to one program. There are other AI tools emerging as well. For example, I understand that even Adobe Photoshop has included AI in their software. So I don't think it's reasonable to keep promoting one AI tool when there are many. And it is not ethical for us to do it as well […] so I prefer the possibility to experiment but not to be engaged with any tools for too long. (Joan, personal communication, 11 April 2024)*

This experimental approach, however, means that specific knowledge about a tool has limited possibilities to accumulate and be synthesised, restricting opportunities to use a tool effectively. Moreover, there are no unified guidelines which digital tools to use and a lack of knowledge exchange across departments. Therefore, most often practitioners need to independently determine which tools and how to use them. As the representative from the Urban Environment & Public Works Department reflected:

> *I haven't grown up with those digital tools and I don't even know the different tools out there. It's not hard for me to learn to use them, but I'm not aware of what kind of digital tools can be used. (Ida, personal communication, 12 April 2024)*

Given the broad range of digital participatory planning tools available, making an informed decision about which tool to try out would require a significant amount of dedicated research. As far as we know, practitioners are not specifically tasked with the responsibility of applying digital tools, therefore it is not a priority in their day-to-day tasks. Furthermore, knowing a digital tool would need to eventually go through a procurement process, and there is no guarantee of the tool being selected, advocating for a specific tool might not be particularly motivating.

The UAI team has observed a similar challenge that our case study city government has in other municipalities too, that a lack of knowledge exchange across the departments also limits the adoption of the UAI tool (Lorenz, personal communication, 3 May 2024). In response, they have offered consultancy services to facilitate collaboration and consensus-building among departments to support shared understandings and find better uses for the UAI platform. This was also offered to our case study city government in the talks with the Curator of the Participation Hub, however the offer was not taken up by for reasons unknown to us. In any case, given that the Curator is part of the Urban Planning Department where the tool has not been used, then it seems unfitting for them to take on the responsibility of developing a support system for using the UAI platform and collaborating with UAI to do so.

The practitioners' approach towards UAI is also influenced by past experiences with other digital participatory planning tools that the municipality has paid for. For example, the development of an participatory AR App (brought out in the Case Context) was a bittersweet experience as maintaining the app became outweighed in comparison to the perceived value it provided. Eventually, the app was discontinued and is no longer in use. The practitioners from the Spatial Planning department were involved in the development of the app, as is encouraged by the literature to ensure the tool meets the intended requirements (Eilola et al., 2023), yet overall this was not a successful collaboration. As the Head of Spatial Planning at SMO reflects:

> *Digital tools can become a burden… Our primary role is to provide the city with spatial solutions, to design space, not develop tools, or to provide happy living for IT companies who charge a lot for maintenance. (Joan, personal communication, 11 April 2024)*

This also exemplifies a somewhat reserved attitude towards the companies responsible for developing digital tools, and finding an imbalance between the provided services and the gained value.

Some practitioners perceive applying any kind of digital tool as an unnecessary burden. Participatory activities usually take place after regular work hours, during which both the practitioners and the participants have most likely already spent much of their time behind screens, which is why many practitioners prefer to stick to analogue methods. So even though the UAI tool is primarily meant to facilitate face-to-face communication, it can still be perceived first and foremost as a digital tool, which is well illustrated in the following statement:

> *Digital tools can be really useful but at the same time, a successful collaboration very much depends on how the people are feeling and what kind of vibe there is in the room. Usually, we run these public participation projects in later parts of the work day, maybe in the evening, meaning that we ourselves have been staring at screens for eight hours straight. And these people we want to engage with have also been staring at screens… Do we actually wish for them to kind of engage naturally, or do you want to force them to spend extra time on computers is a question as well. (Joan, personal communication, 11 April 2024)*

Furthermore, another architect-planner highlighted that when using UAI, it is important to facilitate the workshop together with someone already familiar with the tool. However, this sets limitations in finding the appropriate co-facilitator given the lack of familiarity with the tool in the city government.

> *But with using these tools [like UrbanistAI], it would be better if you have a colleague who can help you, because you can't do many things at the same time. So that's why sometimes it's easier just to talk. (John, personal communication, 20 March 2024)*

An uncertainty surrounding the UAI platform becomes even more apparent because the information about how the licences work might not travel as the UAI tool reaches new users within the city government. For example, the Education Department which organised the Youth Forum asked for a brief tutorial from one of the facilitating architect-planners. Thereafter they attempted to use the UAI tool independently at a workshop. However, it was acting so slow that they decided to stop using the tool midway through the workshop.

> *I think we got stuck because [the city government] has two accounts… then if we entered with one account, it got really slow and then we decided that we would let it go. (Karen, personal communication, 19 April 2024)*

We are not aware of any additional reasons why the UAI platform was slow, but the fact that the issue was not reported also highlights a lack of a support network for using the tool. When the tool did not work, they quickly switched to an analogue method, and the workshop for them was still a success. This suggests that if a tool is unreliable, it reinforces the perception that, while interesting, it cannot be relied upon and therefore would not be the first choice for use.

When discussing the supportive factors for adopting UAI, it was mentioned that the city's 2035 Strategy encourages digital innovation projects. While this could act as a supportive

aspect, within our case context it acts as a limitation. The practitioners have witnessed technologies being promoted for their innovation, whereas they, as practitioners and intended users of the tools, have not found use for the tools. This has been the case for the digital participatory tools found in the Participation Hub, which none of the practitioners we spoke to had used. Although the Street Redesign Workshop is perceived as being useful, its recording as a promotional video on the Ministry of Climate's Youtube channel has given it a glamorous veneer that may overpromise the actual benefit of the tool. Furthermore, related to the purchase of the UAI licences, the fact that the Ministry was behind the financing instead of the municipality, raised questions, suggesting it may have been a strategic move to fulfil certain criteria for EU funding or a PR project:

> *Why the ministry paid for the licences was unclear and remains unclear to this day because we could have provided these licences for ourselves - [the city] has quite a large budget for digital innovation or urban planning projects. So I think the reason why the Ministry decided to collaborate with the city on this workshop was that the Ministry had to show the European Union that it is engaged in a couple of digital innovation projects. (Joan, personal communication, 11 April 2024)*

> *Why was the UAI licence bought? I think it's a bit of a PR project, to be honest. It was the Ministry, in cooperation with them, we did the Street [Redesign] workshop. And I think that somehow, through there, we got the licences. Honestly, I'm not quite sure why we bought them. (John, personal communication, 20 March 2024)*

While we have not looked into the motivations behind the Ministry's actions further, we find these statements illustrative to highlight how practitioners perceive UAI to be used for hidden agendas, which in general indicates to lowering their trust towards digital tools as they could be used to fulfil purposes besides the intended use of the tool.

In this part of the analysis, we have identified various enactments associated with the ontology of a commercial digital tool. These include the following: a tool that requires procurement; a tool primarily for experimentation; a tool to fulfil digital innovation goals; a tool that serves the interests of the company that developed it; a tool as a resource burden. All of the enactments show the challenges of adopting UAI as a digital tool within a municipality. In the final part of the analysis, we will outline the key findings and draw conclusions on how the discussed ontologies impact the adoption of the tool overall.

4.2.3 Key Findings

In our analysis, we have identified that the UAI platform can potentially address some of the challenges inherent to participatory planning and support Communicative Planning Theory (CPT) principles such as levelling of stakeholders, creating a shared understanding, mutual learning, fostering a positive atmosphere and facilitating discussion. The fluidity of UAI can be illustrated in the way the visualisation and communication features continuously interchange their roles - the generated images act as prompts for discussion, and the discussion is in turn used to create textual prompts for creating images. However, the dual features of visualisation and communication give the UAI platform fluidity to such an extent that the tool may be equally interpreted to be primarily used for designing, and not communication. This is reinforced by a significant limitation to the fluidity of the UAI platform as discussions from the workshop can stay untraceable unless the facilitator takes extra steps to record them. Since the enactment of the tool depends highly on the workshop facilitator, participants and materials, then the use of the UAI tool across the city government would benefit from 'confining fluidity'. What we mean by this is agreeing on the appropriate workshop settings, and facilitator role to ensure more predictable and favourable outcomes when using UAI. This is especially important given that some practitioners recognise the risk of the tool being perceived mainly as a design tool and, therefore, are hesitant to let the tool organically travel across the city government, fearing it might undermine the expertise of the architect-planners.

Being a commercial digital tool, UAI is upheld to procurement requirements and a reserved approach from practitioners who avoid relying on specific digital tools for their participatory planning practices, and rather approach them as relevant for one-time projects. This prevents the accumulation of knowledge on the effective use of the tool among practitioners and in the city government as a whole. This is further reinforced as spatial and participatory activities are carried out across different departments, and practitioners handle a diverse set of projects each requiring a tailored approach in the methods applied. Such fragmentation further increases the risk that the UAI tool is misused since the experiences of using the tool are not widely shared. Lastly, UAI is also perceived to fulfil hidden agendas of digital innovation, which limits the trust towards the tool for some practitioners.

We argue that the tension between the two ontologies manifests in the way that the UAI tool is simultaneously perceived as useful for public engagement, yet at the same time viewed as temporary, mainly suited for experiments. While we do not advocate that the city government should necessarily adopt the UAI tool, a similar fate seems to be encountered by digital participatory tools in the city government in general. During our interviews, informants mentioned that another digital tool for participatory planning, Maptionnaire, had been used in two departments (Ida, personal communication, 12 April 2024; John, personal communication, 15 March 2024). While there was initial optimism about the tool, they remained uncertain about its overall value and were left with many unanswered questions, such as how to synthesise the data or use the features within the tool. We find there are missed opportunities in using UAI and digital tools for participatory planning in general due to a lack of accumulated knowledge of the tools across departments.

For a wider adoption and a more effective use of UAI, we argue a shared understanding amongst the practitioners is necessary. This would mean mutual learnings on the intricacies of using the tool across different departments where spatial and participatory activities are carried out. Here, we conclude our analysis, and Chapter 4, and discuss the further implications of our findings in the upcoming chapter.

CHAPTER 5

5.1 Discussion

We set out to study the Pilot Phase of UrbanistAI in a Northern European city government, aiming to be sensitive towards the possible tensions when adopting a digital tool for participatory planning. In this section, we will interpret our key findings by drawing on existing literature and bring out the contribution of our research for the city government. Furthermore, we will discuss the significance of our results within the broader socio-technical landscape at the intersection of planning, technology, and participation. We also bring out limitations for the study and suggest future research opportunities.

Our research was guided by questions:

How can the Pilot Phase of UrbanistAI in a Northern European city government help understand the challenges of adopting 3D visualisation tools for participatory planning in municipalities?

> How are the challenges of participatory planning addressed with UrbanistAI?
>
> How might the conceptualisation of UrbanistAI as a fluid technology provide insights to inform decision-making?

The findings are based on the empirical data produced from the semi-structured interviews with the practitioners of the city government as well as the UAI co-founder, analysis of documents and other pre-existing materials and additionally, participant observations using the UAI tool.

Within our findings, we identified how UAI can be enacted as a useful tool to support communicative planning. Practitioners appreciated how using UAI helped to level stakeholders and provided a shared language, created a positive atmosphere encouraging interaction of participants, as well as facilitated discussion by exploring unexpected scenarios with image generation. These aspects all address known challenges in participatory planning and are aligned with CPT principles. The findings also confirm existing literature on 3D visualisation tools about their potential benefits (Eilola et al., 2023; Lovett et al., 2015) and extend the research to include the nuances of text-to-image technology.

However, the fluidity of the tool causes the enactments of UAI to vary with different facilitators, workshop settings and participants to such an extent that the use of the tool may be unpredictable, and therefore may even lead to unfavourable enactments. We introduced the concept of confining the fluidity of the UAI tool to provide more expected outcomes in workshop settings. We have not come across such an approach in literature on fluid technology before. What de Laet & Mol (2000) found through their study of the Zimbabwe Bush Pump 'B' type was that it was the fluid characteristics of the pump that made it loved and used in very many settings in Zimbabwe. Contrary to this, we believe that the current fluid characteristics of the UAI tool in workshop settings in the city government might not work in favour of the participatory activity. Therefore, we see a potential for introducing an aspect that can provide boundaries to the tool. What form and shape this might take is something that has to be tailored to the needs of the city government and the practitioners, but we see this done at least through spoken agreements on appropriate workshop settings and the role of the facilitator. The acknowledgement of the risks that come about with the tool's high adaptability is important for decision-making and possible adoption strategies, especially given the varied skill sets among practitioners and a lack of specific training for introducing the UAI tool.

The laissez-faire approach, hoping that practitioners would organically adopt the UAI tool, did not yield the expected results, as the tool, according to the Head of Digital Construction, was underused during the Pilot Phase (Michael, personal communication, 26 April 2024). We find the approach is not unique to UAI but reflects a general tendency in the city government regarding the introduction of digital participatory tools. This seems to further reinforce practitioners' ambivalence about integrating digital tools into their practices as it is not a priority within their day-to-day tasks. This gives us insight into the broader challenges for adopting digital tools into participatory planning practices.

Given that the knowledge about digital tools is fragmented across practitioners and departments, we find it important to create a common space for sharing reflections on the use of the tools and their perceived value. Our contribution lies in taking the first step to create such an environment by sharing our findings from the study and bringing together our informants as well as the developers of UAI. While the practitioners are mostly acquainted with each other, this might be the first time they are brought together in such a configuration.

Before we began our fieldwork, we had decided not to take a stance on whether the city government should pursue the purchase of the licence. Given the tensions we have identified, this decision seems even more crucial. We do not want to imply that we, as researchers, have a hidden agenda in promoting this tool. We recognise that sharing the results will be a delicate situation as any description is also an intervention. Here we rely on Vikkelsø (2007), who argues that:

> *"... descriptive research exactly puts itself at risk to the extent it exposes its descriptions to a multiple audience and allows itself to become affected by reactions from this audience. ... [W]e might think of good research as the research that embraces the fact that research intervenes in the ongoing formation of life and therefore acknowledges that it may also put others at risk through the circulation and translation of its descriptions." (p. 307)*

For our informants, we find it important to highlight the various enactments of the UAI tool, while equally refraining from focusing on the contradictions around the initiation of the Pilot Phase, which could lead into discussions about who is right and wrong. Instead, we aim to draw attention to the risks around the adaptability of the tool and missed opportunities stemming from the current lack of accumulated knowledge apparent within the use of UAI and digital tools in general.

Our study contributes to the broader socio-technical discussions around adopting digital participatory planning tools. Focusing on 3D visualisation tools for communicative planning, we explore its use in a real-life setting within a case study, extending the literature by examining UAI (and consequently, text-to-image technology) within this context. To our knowledge, no previous studies have been published on the use of UAI, although we are aware of several scholarly works currently in progress (Lorenz, personal communication, 2023).

We find that the concepts of fluidity and ontological multiplicity were effective in addressing the complexities of understanding the interactions with the UAI platform. The framework supported our analysis for identifying the diverse ways UAI was practised across various configurations of facilitators, participants and workshop settings. Without this approach, integrated with CPT, noticing these nuanced enactments might have been challenging for informing decision-making.

The limitations of our study lie in the limited access to participant observations of UAI in workshop settings. A retrospective approach with the production of empirical data primarily through semi-structured interviews was necessary due to restricted access and the limited number of workshops conducted. This constraint has tilted our socio-technical analysis towards social aspects. We acknowledge this, and though we have tried to shed light on the multitude of actors - both human and non-human - in the interviews, we currently rely heavily on the descriptions and impressions of our informants. However, we recognise that in-person observations of workshops would have allowed us to pursue a more nuanced understanding of how UAI is enacted in the city government. A method that would align with Annemarie Mol's way of doing ontological multiplicity in medical practices (Mol, 2002).

For future research, we see opportunities in including empirical data from participant observations in workshop settings, which, additionally, opens up for an exploration of how the tool is practised by the workshop participants. By including both the practitioners and participants viewpoints, it would be possible to build a more comprehensive understanding on the enactments of the tool. Additionally, we encourage further work on fluid technologies to explore whether the need for confinement of the fluidity is something significant for text-to-image tools, given their unique characteristics.

Here we end with discussion and Chapter 5. We will share our concluding remarks in the upcoming chapter.

CHAPTER 6

6.1 Conclusion

In this study we have explored the use of UrbanistAI, a 3D visualisation tool for communicative planning, during the 6-month Pilot Phase in a Northern European city government. We ground our research in the realities of the planners' everyday practices. Using a case study approach, we acknowledge the complexity of the intersection of participation, planning and technology, while also considering the additional dimensions introduced by new digital tools. Our research was guided by the questions:

How can the Pilot Phase of UrbanistAI in a Northern European city government help understand the challenges of adopting 3D visualisation tools for participatory planning in municipalities?

> How are the challenges of participatory planning addressed with UrbanistAI?
>
> How might the conceptualisation of UrbanistAI as a fluid technology provide insights to inform decision-making?

We built our empirical data on semi-structured interviews with the practitioners of the city government as well as the UAI co-founder, analysis of documents and pre-existing material, and participant observations using the UAI tool. In our analysis, we explored UAI in the enactments of two ontologies in the city government: a visualisation tool for communication and a commercial digital tool. Our key findings show that the fluidity of the tool supports practising communicative planning principles, yet poses a risk for unexpected outcomes given the dependence on the facilitator, participants and workshop materials. We propose 'confining fluidity' by encouraging practitioners to make agreements on the appropriate workshop settings and role of the facilitator to support more predictable outcomes. We argue that the acknowledgement of fluidity of UAI within the city government provides insights for the potential impact of the tool. Furthermore, the practitioners' tendency to approach UAI and digital tools in general with an experimental mindset, viewing them as temporary, means that knowledge about tools does not accumulate across departments. Practitioners are left to find and figure out tools independently, which equally prevents efficient use of the tools.

Our contribution lies in sharing our findings with the city government to bring out the multiple ways the UAI tool is enacted, highlighting the risks due to the tool's high adaptability and the issue of limited knowledge accumulation across departments. Our study further contributes to the broader socio-technical discussions around the adoption of 3D visualisation tools with a key contribution being our examination of such a tool that uses text-to-image technology in a real-life setting. Future work would benefit from including the participants' perspectives and technological aspects to create a more comprehensive understanding of the tool in practice. Further work on fluid technologies may benefit in exploring the need for confinement of the fluidity for text-to-image tools given their unique characteristics.

We find that a techno-anthropological lens and the concepts of ontological multiplicity and fluid technology integrated with CPT as a foundational layer for understanding the aims and goals of participatory planning practitioners, provide the necessary sensitivity to delicately approach the inherent complexities at the intersection of these fields - planning, participation and technology. Our main aspiration has been to offer an empathic account of the realities for city government practitioners when encountering new technologies, an understanding that can only be achieved by zooming in closely.

References

Alfasi, N. (2021). Why public participation isn't a tool for democratizing planning. A comment. *Planning Theory*, *20*(2), 175–178. https://doi.org/10.1177/1473095221991487

Allmendinger, P., & Tewdwr-Jones, M. (1998). Deconstructing Communicative Rationality: A Critique of Habermasian Collaborative Planning. *Environment and Planning A: Economy and Space*, *30*(11), 1975–1989. https://doi.org/10.1068/a301975

Andersson, V. (2013). Technology Transfer in Developing Countries -a case study from Bolivia. In L. Botin & T. Børsen (Eds.), *What is Techno-Anthropology?* (pp. 311–330). Aalborg Universitetsforlag.

Arnstein, S. R. (1969). A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*, *35*(4), 216–224. https://doi.org/10.1080/01944366908977225

Barry, J., & Legacy, C. (2023). Between virtue and profession: Theorising the rise of professionalised public participation practitioners. *Planning Theory*, *22*(1), 85–105. Scopus. https://doi.org/10.1177/14730952221107148

Beauregard, R. A. (2012). Planning with Things. *Journal of Planning Education and Research*, *32*(2), 182–190. https://doi.org/10.1177/0739456X11435415

Børsen, T. (2022). Bridging Engineering and Humanities at Techno-Anthropology. In S. H. Christensen, A. Buch, E. Conlon, C. Didier, C. Mitcham, & M. Murphy (Eds.), *Engineering, Social Sciences, and the Humanities: Have Their Conversations Come of Age?* (pp. 151–177). Springer International Publishing. https://doi.org/10.1007/978-3-031-11601-8_8

Botin, L., & Børsen, T. H. (Eds.). (2021). *Technology Assessment in Techno-Anthropological Perspective*. Aalborg Universitetsforlag. https://aauforlag.dk/shop/forside-e-boeger/technology-assessment-in-techno-anthropologic.aspx

Brade, S., Wang, B., Sousa, M., Oore, S., & Grossman, T. (2023). Promptify: Text-to-Image Generation through Interactive Prompt Exploration with Large Language Models. *arXiv.Org*. https://doi.org/10.48550/arxiv.2304.09337

Brownill, S., & Inch, A. (2019). *Framing people and planning: 50 years of debate*. https://doi.org/10.2148/benv.45.1.7

Bylund, J. (2013). Plassein: On the fluid mobility of place and urban qualities in planning. *Planning Theory*, *12*(3), 244–266. Scopus. https://doi.org/10.1177/1473095212459732

Calderon, C., Mutter, A., Westin, M., & Butler, A. (2024). Navigating swift and slow planning: Planners' balancing act in the design of participatory processes. *European Planning Studies*, *32*(2), 390–409. https://doi.org/10.1080/09654313.2022.2156271

Choi, J., Kushner, K. E., Mill, J., & Lai, D. W. L. (2012). Understanding the Language, the

Culture, and the Experience: Translation in Cross-Cultural Research. *International Journal of Qualitative Methods*, *11*(5), 652–665. https://doi.org/10.1177/160940691201100508

Christian. (2023, November 21). *Semi-structured interview with Christian—Previous project* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet].

Coyle, C. (2023, March 8). *How to Translate Webpages in Google Chrome*. MUO - MAKE USE OF. https://www.makeuseof.com/google-chrome-translate-webpages/

de Laet, M., & Mol, A. (2000). The Zimbabwe Bush Pump: Mechanics of a Fluid Technology. *Social Studies of Science*, *30*(2), 225–263. https://doi.org/10.1177/030631200030002002

Eilola, S., Jaalama, K., Kangassalo, P., Nummi, P., Staffans, A., & Fagerholm, N. (2023). 3D visualisations for communicative urban and landscape planning: What systematic mapping of academic literature can tell us of their potential? *Landscape and Urban Planning*, *234*, 104716. https://doi.org/10.1016/j.landurbplan.2023.104716

#Envision2030 Goal 11: Sustainable Cities And Communities | Division for Inclusive Social Development (DISD). (n.d.). Retrieved 24 November 2023, from https://social.desa.un.org/issues/disability/envision-2030/envision2030-goal-11-sustainable-cities-and-communities

Epstein, Z., Hertzmann, A., Herman, L., Mahari, R., Frank, M. R., Groh, M., Schroeder, H., Smith, A., Akten, M., Fjeld, J., Farid, H., Leach, N., Pentland, A., & Russakovsky, O. (2023). Art and the science of generative AI: A deeper dive. *Science*, *380*(6650), 1110–1111. https://doi.org/10.1126/science.adh4451

Eva, & Brian. (2024, April 11). *Semi-structured interview with Eva and Brian* (K. Lindström & P. X. Larsen, Interviewers) [In-person].

Fainstein, S. S., & Campbell, S. (2016). *Readings in planning theory* (Fourth edition., pp. vii–vii). Wiley-Blackwell.

Flick, U. (Ed.). (2022). *The SAGE Handbook of Qualitative Research Design* (1–2). SAGE Publications Ltd. https://doi.org/10.4135/9781529770278

Flyvbjerg, B. (1998). *Rationality and power: Democracy in practice*. University of Chicago Press.

Forester, J. (1999). *The deliberative practitioner: Encouraging participatory planning processes*. MIT Press.

Friedmann, J. (1981). *Planning as Social Learning*. https://escholarship.org/uc/item/0q47v754

Gad, C., & Jensen, C. B. (2010). On the Consequences of Post-ANT. *Science, Technology, & Human Values*, *35*(1), 55–80. https://doi.org/10.1177/0162243908329567

Gün, A., Demir, Y., & Pak, B. (2020). Urban design empowerment through ICT-based platforms in Europe. *International Journal of Urban Sciences*, *24*(2), 189–215. Scopus. https://doi.org/10.1080/12265934.2019.1604250

Healey, P. (2003). Collaborative Planning in Perspective. *Planning Theory*, *2*(2), 101–123. https://doi.org/10.1177/14730952030022002

Healey, P. (2012). Communicative Planning: Practices, Concepts and Rhetorics. In B. Sanyal, L. J. Vale, & C. D. Rosan (Eds.), *Planning Ideas That Matter* (pp. 333–358). The MIT Press; JSTOR. http://www.jstor.org/stable/j.ctt5hhktr.17

Hofer, K., & Kaufmann, D. (2023). Actors, arenas and aims:A conceptual framework for public participation. *Planning Theory*, *22*(4), 357–379. Scopus. https://doi.org/10.1177/14730952221139587

Horvath, A.-S., & Pouliou, P. (2024). AI for conceptual architecture: Reflections on designing with text-to-text, text-to-image, and image-to-image generators. *Frontiers of Architectural Research*. https://doi.org/10.1016/j.foar.2024.02.006

IAP2. (n.d.). *IAP2 Public Participation Spectrum*. IAP2. Retrieved 5 June 2024, from https://iap2.org.au/resources/spectrum/

Ida. (2024, April 12). *Semi-structured interview with Ida* (K. Lindström & P. X. Larsen, Interviewers) [Microsoft Teams].

International Association for Public Participation. (n.d.). Retrieved 4 April 2024, from https://www.iap2.org/mpage/Home

Jacobs, J. (1961). *The death and life of great American cities* (50th anniversary ed. / with a new introduction by Jason Epstein and a foreword by the author.). Modern Library.

Jensen, T. E. (2013). Doing Techno‐Anthropology. In L. Botin & T. Børsen (Eds.), *What is Techno-Anthropology?* (pp. 331–364). Aalborg Universitetsforlag.

Joan. (2024, April 11). *Semi-structured interview with Joan* (K. Lindström & P. X. Larsen, Interviewers) [Microsoft Teams].

John. (2024, March 15). *Semi-structured Interview with John no. 1* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet].

John. (2024, March 20). *Semi-structured interview with John no. 2* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet].

Karen. (2024, April 19). *Semi-structured interview with Karen* (K. Lindström & P. X. Larsen, Interviewers) [Microsoft Teams].

Kitchin, R., Young, G. W., & Dawkins, O. (2021). Planning and 3D Spatial Media: Progress, Prospects, and the Knowledge and Experiences of Local Government Planners in Ireland. *Planning Theory and Practice*, *22*(3), 349–367. Scopus. https://doi.org/10.1080/14649357.2021.1921832

Knott, E., Rao, A. H., Summers, K., & Teeger, C. (2022). Interviews in the social sciences. *Nature Reviews Methods Primers*, *2*(1), 1–15. https://doi.org/10.1038/s43586-022-00150-6

Lane, M. B. (2005). Public Participation in Planning: An intellectual history. *Australian Geographer*, *36*(3), 283–299. https://doi.org/10.1080/00049180500325694

Larsen, P. X., & Lindström, K. (2023). *ELEVATING PARTICIPATION IN URBAN PLANNING: A Techno-Anthropological Study of UrbanistAI's Impact on Communicative and Collaborative Practices* (pp. 1–50). Aalborg University.

Law, J. (2002). Objects and Spaces. *Theory, Culture & Society*, *19*(5–6), 91–105. https://doi.org/10.1177/026327602761899165

Law, J., & Mol, A. (2001). Situating Technoscience: An Inquiry into Spatialities. *Environment and Planning. D, Society & Space*, *19*(5), 609–621. https://doi.org/10.1068/d243t

Lisa. (2023, November 28). *Semi-structured interview with Lisa no. 1—Previous project* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet].

Lisa. (2024, April 5). *Semi-structured Interview with Lisa no. 2* (P. X. Larsen, Interviewer) [Google Meet].

Lorenz. (2023). *Informal talks with Lorenz during internship in the fall of 2023* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet + in-person].

Lorenz. (2024, May 3). *Semi-structured interview with Lorenz* (K. Lindström & P. X. Larsen, Interviewers) [Google Meet].

Lorenz. (2024, June 3). *Invitation to Presentation of Thesis Research + GenAI model* [Personal communication].

Lovett, A., Appleton, K., Warren-Kretzschmar, B., & Von Haaren, C. (2015). Using 3D visualization methods in landscape planning: An evaluation of options and practical issues. *Landscape and Urban Planning*, *142*, 85–94. https://doi.org/10.1016/j.landurbplan.2015.02.021

Lyu, Y., Wang, X., Lin, R., & Wu, J. (2022). Communication in Human–AI Co-Creation: Perceptual Analysis of Paintings Generated by Text-to-Image System. *Applied Sciences*, *12*(22), Article 22. https://doi.org/10.3390/app122211312

M.Given, L. (2008). *The SAGE Encyclopedia of Qualitative Research Methods*. SAGE Publications, Inc. https://doi.org/10.4135/9781412963909

Michael. (2024, April 26). *Semi-structured interview with Michael* (K. Lindström & P. X. Larsen, Interviewers) [Microsoft Teams].

Mina. (2023, December 12). *Semi-structured interview with Mina—Previous project* (P. X. Larsen, Interviewer) [Google Meet].

Mol, A. (1999). Ontological Politics. A Word and Some Questions. *The Sociological Review (Keele)*, *47*(1_suppl), 74–89. https://doi.org/10.1111/j.1467-954X.1999.tb03483.x

Mol, A. (2002). *The body multiple: Ontology in medical practice*. Duke Pniversity Press.

Mol, A., & Law, J. (1994). Regions, Networks and Fluids: Anaemia and Social Topology. *Social Studies of Science*, *24*(4), 641–671. https://doi.org/10.1177/030631279402400402

Morgan, H. (2022). Conducting a Qualitative Document Analysis. *Qualitative Report*, *27*(1), 64–77. https://doi.org/10.46743/2160-3715/2022.5044

Nadin, V., Stead, D., Dąbrowski, M., & Fernandez-Maldonado, A. M. (2021). Integrated, adaptive and participatory spatial planning: Trends across Europe. *Regional Studies*, *55*(5), 791–803. https://doi.org/10.1080/00343404.2020.1817363

Niitamo, A. (2021). Planning in no one's backyard: Municipal planners' discourses of participation in brownfield projects in Helsinki, Amsterdam and Copenhagen. *European Planning Studies*, *29*(5), 844–861. https://doi.org/10.1080/09654313.2020.1792842

Nwatu, J., Ignat, O., & Mihalcea, R. (2023). *Bridging the Digital Divide: Performance Variation across Socio-Economic Factors in Vision-Language Models* (arXiv:2311.05746). arXiv. https://doi.org/10.48550/arXiv.2311.05746

Nyseth, T., Ringholm, T., & Agger, A. (2019). Innovative Forms of Citizen Participation at the Fringe of the Formal Planning System. *Urban Planning*, *4*(1), 7–18. https://doi.org/10.17645/up.v4i1.1680

Potts, R., & Webb, B. (2023). Digital planning practices: Benchmarking planners' use of information and communication technologies (ICTs). *Planning Practice and Research*, *38*(4), 520–540. Scopus. https://doi.org/10.1080/02697459.2023.2216492

Rando, J., Paleka, D., Lindner, D., Heim, L., & Tramèr, F. (2022). *Red-Teaming the Stable Diffusion Safety Filter* (arXiv:2210.04610). arXiv. https://doi.org/10.48550/arXiv.2210.04610

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*(2), 155–169. https://doi.org/10.1007/BF01405730

Robertson, T., & Simonsen, J. (2012). Participatory design: An introduction. In *Routledge International Handbook of Participatory Design* (pp. 1–18). Scopus. https://doi.org/10.4324/9780203108543

Rydin, Y., & Tate, L. (Eds.). (2016a). *Actor Networks of Planning: Exploring the Influence of Actor Network Theory*. Routledge. https://doi.org/10.4324/9781315714882

Rydin, Y., & Tate, L. (2016b). Exploring the influence of ANT. In *Actor Networks of Planning* (1st ed., pp. 3–24). Routledge. https://doi.org/10.4324/9781315714882-1

Sager, T. (2009). Planners' Role: Torn between Dialogical Ideals and Neo-liberal Realities. *European Planning Studies*, *17*(1), 65–84. https://doi.org/10.1080/09654310802513948

Sager, T. (2017). Communicative Planning. In *The Routledge Handbook of Planning Theory* (1st ed., pp. 94–104). Routledge.

Slotterback, C. S., & Lauria, M. (2019). Building a Foundation for Public Engagement in Planning: 50 Years of Impact, Interpretation, and Inspiration From Arnstein's Ladder. *Journal of the American Planning Association*, *85*(3), 183–187. https://doi.org/10.1080/01944363.2019.1616985

Steinfeld, K. (2023). Clever little tricks: A socio-technical history of text-to-image generative models. *International Journal of Architectural Computing*, *21*(2), 211–241. Scopus. https://doi.org/10.1177/14780771231168230

Stryker, C., & Scapicchio, M. (2024, March 22). What is Generative AI? *Think | IBM*. https://www.ibm.com/topics/generative-ai

Toretei. (n.d.). *Toretei*. Toretei. Retrieved 3 April 2024, from https://toretei.com

UNSD. (n.d.). *Standard Country or Area Codes for Statistical Use*. Methodology. Retrieved 3 June 2024, from https://unstats.un.org/unsd/methodology/m49/

UrbanistAI. (n.d.). *UrbanistAI*. UrbanistAI. Retrieved 19 October 2023, from https://urbanistai.com

UrbanistAI (Director). (2023, March 7). *UrbanistAI - Participatory design in Helsinki*. https://www.youtube.com/watch?v=ffzMSYlRhaE

Vikkelso, S. (2007). Description as Intervention: Engagement and Resistance in Actor-Network Analyses. *Science as Culture*, *16*(3), 297–309. https://doi.org/10.1080/09505430701568701

What is 3D rendering? | Adobe Substance 3D. (n.d.). Retrieved 4 June 2024, from https://www.adobe.com/products/substance3d/discover/3d-rendering.html

Williams, Z. (2023, April 18). 'AI isn't a threat' – Boris Eldagsen, whose fake photo duped the Sony judges, hits back. *The Guardian*. https://www.theguardian.com/artanddesign/2023/apr/18/ai-threat-boris-eldagsen-fake-photo-duped-sony-judges-hits-back

Yiftachel, O. (1995). Planning as control: Policy and resistance in a deeply divided society. *Progress in Planning*, *44*(2), 115–115. https://doi.org/10.1016/0305-9006(95)90158-2

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6. edition.). SAGE Publications, Inc.

Appendix A

Interview Guide, Joan

Introductory remarks:

Thank you so much for agreeing to talk with us once again. That is very much appreciated.
We have the interview scheduled for 50 minutes, so we'll keep to this time frame.

A few notes before we get started about us as well.
We are studying Techno-Anthropology in Copenhagen, at Aalborg University which essentially is a symbiosis of technology and anthropology, so studying the impact of technology with an anthropological approach and toolkit. So as we both have a background in urban space - Pernille studied Urban studies in Denmark, and I studied at [redacted] architecture and urban planning for 3 years. And that's why we are interested in the use of digital tools used in urban planning. Not from the architect's point of view to optimise processes, but exactly from the participatory planning point of view in involving citizens and other stakeholders. And that's what our thesis is about - we're using [redacted] as a case study to study the use of UrbanistAI and digital tools in general for participatory planning.

We know it has been quite limited, so we're equally interested in the limitations of using such tools.

As you might already know, we have talked with [redacted] and [redacted] already too. And we're visiting Participation Hub later today together with [redacted] and [redacted] from IT. Also, we're talking with [redacted] from [redacted] and hopefully also [redacted] from the Education Department. And we'll be asking you at the end of the meeting whether you find there's anyone else who we could talk to.

One more thing before we start - we also met in the summer, we were participating in one of the meetings you had with [redacted] in preparation of the [redacted] ws, but we want to stress that we're not affiliated with UrbanistAI. But of course, we will be sharing results of our findings with them at the end of study, and also with you if you're interested.

First some formalities. I'd like to check with you if we can record our talk. Our talk is only used to inform our thesis research, and anything we end up using in the report will be anonymised.
And you can at any time withdraw your statements if you wish to. Do you agree we record the talk?
Just so you know, I'll be the primary interviewer and Pernille will follow up with some questions along the way.
Okay, so let's start with the interview.

So we know you are the Head of the Spatial Planning Department in the Strategy Center and you lead a team of 10 people - 9 architect-planners and a city art curator. Could you please share a bit more what your role entails?

We'll move on to the topics of the [redacted] workshop and then later on talk about participatory planning practices in more general terms.

[redacted] WS & Use of UAI

So let's start by talking about the [redacted] workshop.
We know it took place a while ago, in August, and we'd first like to know more about preparatory works leading up to the workshop.

- How was the project initiated?
- Why was it decided to use UrbanistAI?

    - *How did you/the team decide to use UrbanistAI for this specific [redacted] project?*
    - *Without knowing much about UrbanistAI beforehand, what did you think about trying out this new tool for the [redacted] Workshop?*
    - *So what we understand is that xyz was the goal for the [redacted] workshop. Is this correctly understood?*
- Do you think UrbanistAI fulfilled this goal?
- How would you compare UrbanistAi & the workshop methodology to other methods you use for participatory planning?

We are aware that the workshop was conducted in collaboration with the climate ministry.

- What kind of roles did each of the two organisations have?
- It was decided to buy the license for a year - what was the reasoning behind this compared to just buying the license for the one-time project?

- Have you considered using UAI for any other projects?
- We understand the license ends sometime at the start of the summer. Would you want to extend the license?

- Before you found out about UrbanistAI, were you and your team searching for a new digital participatory planning tool?
    - Did you feel there was a need that in engaging with the public for which you didn't have a tool to address?

Digital Tools

From our interviews with [redacted] and [redacted], we understand that you have access to other digital tools like Maptionaire and there are also tools available in the participation hub. As head of the team, what is your and your team's approach to using these or other digital tools for participatory planning?

- What has shaped this approach?

Now that we have covered the use of UrbanistAI and digital tools, let's now focus in on more about Participatory Planning in general.

Participatory Planning

- By doing this thesis, we have also worked through academic literature on participatory planning, and what is interesting is there doesn't seem to be a consensus in defining what participatory planning is. So that's why we would like to hear from you as a practitioner, how would you define and describe participatory planning?
    - *If she doesn't already answer this, then ask: We would also like to ask about the 'why' which also has many different views on the reasons why to do participatory planning. In your view, why should participatory planning be done?*
- What has shaped your principles/understanding of Participatory Planning?

- These might already be covered, but can ask them if they're not covered:
    - What do you find as the greatest benefits for doing participation?
    - What do you find as the biggest challenges for doing participation?

Participatory Planning in [redacted] City Government

We know you do a lot of partnerships together with [redacted] and other departments in [redacted] for organizing architecture competitions and collaborating on other spatial project where you engage with the public too. One example being the [redacted] Street Competition.

We'll start with a very general question

- How would you describe participatory planning as it is carried out in [redacted]?
    - *How much it's done, how it's done, how engaged citizens are etc.*
- What do you find important in the role and characteristics of the architect-planner in terms of participatory planning in [redacted]?
- Does this differ from what you view for the participation specialist?
- How do you envision these roles practised within the city government?
    - *Do you see these roles combined in one person or within multiple people working in collaboration?*

- If not already answered:
    - How are they then practiced?

Participation Principles document [redacted]

We have heard that a document for participatory planning practices was or is in the making. We don't know much you have been involved in the process of creating document. Could you share a bit more about what was the goal of creating this document? Who was part of the team of creating this document?

We might already cover Participation Hub with previous questions. If we have, then no need to ask about it.
Participation Hub: How have you or anyone from your team been involved with the Participation Hub?

Closing remarks
Around 13:45
We are reaching the end of our interview time. Is there anything else you'd like to bring out/add to the topics we've discussed today?
Do you have any suggestions whether there is anyone else who we should interview from [redacted]?

Thank you so much for your time