BACHELOR THESIS

PUBLIC FRONTRUNNERS OF DIGITISATION

CIVIL SERVANTS AND THE ADOPTION OF DIGITAL PARTICIPATORY PLANNING TOOLS IN LOCAL DISTRICT DEPARTMENTS – A CASE STUDY OF THE CITY OF HAMBURG

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PUBLIC GOVERNANCE ACROSS BORDERS

Word count: 10969

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30.6.2022

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ABSTRACT

Civil servants are the engine of public administrations and pivotal for delivering good public services. Citizen participation presents the core of democracy and legitimates public administration decision-making. In the wave of digitisation of cities, innovative digital tools have been booming, promising enhanced participatory planning (PP) and more comprehensive public engagement. This study investigates the role of civil servants' attitudes toward adopting digital participatory planning tools (DPPT) in the context of local spatial planning in Hamburg's district departments. The Technology Acceptance Model (TAM) is a theoretical approach relating civil servants' attitudes and behaviour to their intention to use new digital tools in participatory planning (PP). The Four criteria, experience, training, usability, and trust, are identified from the literature review to influence civil servants' behavioural intention to use digital tools. This thesis uses a case study approach combined with qualitative semi-structured expert interviews to explore civil servants' attitudes towards DPPT. Data analysis follows the thematic content analysis method conducted in the software ATLAS.ti. The thesis concludes that prior experience with DPPT and the perceived added value of tools in PP positively affect civil servants' decision to adopt digital tools accompanying conventional PP practice.

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LIST OF ABBREVIATIONS

DIPAS = Digital Participation System

DPP = Digital Participatory Planning

DPPT = Digital Participatory Planning Tools

MDH = Urban Ministry of Housing and Development

PP = Participatory Planning

STW = Urban Workshop (Sub-Unit of the Hamburg Urban Ministry of Housing and Development)

TAM = Technology Acceptance Model

1. INTRODUCTION

The digitisation of the administration in Germany is progressing only slowly. Germany ranks eleventh in the European comparison of the digital economy and society Index (DESI) in 2021 (Statista, 2022a). The Bavarian Research Institute for Digital Transformation (bidt) examined the state of digitisation in the German administration. It concluded that Germany still has much catching up to do (Digital Administration Bidt, 2022). By the end of 2022, public administration in Germany must become digital as stipulated in the Online Access Act (OZG).

Participatory Planning (PP) has been criticised vehemently for not being representative hence not including all demographic groups of the population. Digital participatory planning (DPP), thus the adoption of digital participatory planning tools (DPPT) presents an excellent asset to overcoming participation barriers in PP, offering a more comprehensive range of timely, flexible and remote participation opportunities (Bouzguenda et al., 2019; Nochta et al., 2020; Yigitcanlar et al., 2019). However, with the 'digital' label comes the responsibility for administrations and thus civil servants to deliver cost-efficient and sustainable digital solutions. Several authors have addressed the issue of neglecting social sustainability when implementing technical solutions finding that smartness and social sustainability do not mutually condition each other (Bouzguenda et al., 2019).

Engagement requires a culture in public organisations that supports openness to adopting new DPPT. Civil servants are the engine for implementing innovative digital solutions in local district PP (Moynihan, 2013). In practice, civil servants at the local district level face various challenges in engaging the public. Besides the difficulty of creating and sustaining barrier-free participation events, civil servants face the issue of diminishing citizens' trust in government institutions (Curry, 2012; Michels & De Graaf, 2010). Additionally, a lack of diversity and representativeness is a common challenge that civil servants must address in PP processes (McNeely & Hahm, 2014). In a technological age of optimisation, the scarcity of time and resources and the investment in costly activities such as involving the public in urban development projects are crucial considerations for public managers. Most research has focused on transformations of public organisations and organisational processes (Rainey, 2005; Nograšek & Vintar, 2014). However, civil servants' attitudes have been neglected in the study of innovative government technology adoption (Guenduez et al., 2020; Moynihan, 2013). Research into implementing information and technology systems (ICT) in participatory planning in the past decades has shown that civil servants' perceptions and interpretations of new technology influence their adoption and deployment in urban development projects (Moynihan, 2003; Slotterback, 2011). Vonk et al. (2007) call for research that enhances

understanding the needs and perceptions of public practitioners as technology users. This study takes the public administrator perspective because it is through this lens that practical dilemmas in implementing public participation policy can be considered.

Hamburg ranks highest in administration digitalisation and transparency rankings and has been recently known for developing a new digital participation tool (DIPAS) to support PP processes in local district planning (Transparency Ranking Germany, 2022). This study's concern is how civil servants' attitudes influence the adoption of new DPPT like DIPAS in local district governments. Thus, the research question (RQ) of this thesis is:

How do civil servants' attitudes influence the adoption of DPPT in local district participatory planning? – A case study of the Free Hanseatic City of Hamburg

Four sub-research questions were formulated complementing the main research question formulated:

(1) What are civil servants' attitudes towards technology?
(2) What are civil servants' attitudes towards the useability of DPPT?
(3) How does civil servants' experience with DPPT affect their decision to opt for a digital or conventional approach in participatory planning?
(4) How does DPPT training affect civil servants' decision to opt for a digital or conventional approach in participatory planning?

The first RQ describes the factors influencing civil servants' attitudes and behaviour towards technology, such as their confidence and familiarity with technology. The second research question investigates the attitudes of civil servants related to the perceived usability, hence the perceived added value of DPPT. The third research question refers to the effect of civil servants' experience on their likeliness to adopt DPPT in PP processes. Finally, the fourth research question investigates the effect of DPPT skill development through training on the civil servants' decision to go for a DPP or conventional participation approach in PP.

This thesis paper is structured in the following manner. The first part of this thesis comprises the theoretical background and relevance of the role of civil servants in public organisations following organisational theory. The following section illustrates the background of DPP and civil servants' role in adopting DPPT. Here, the Technology Acceptance Model (TAM) is presented as a theoretical approach to predict civil servants' behavioural intention to adopt DPPT in PP processes. In chapter three, the method of this study is presented, structured in the presentation of the research design, case selection, data collection and data analysis. The analysis discusses this study's results and answers the research question and sub-research

questions. Finally, the research findings are discussed and related to previous studies in the field. Additional findings are presented, and recommendations for future research are made. Conclusions are drawn about the relationship between civil servants' attitudes towards technology and the adoption of DPPT in PP processes in local district planning.

2. THEORETICAL FRAMEWORK

In this section, the organisational and behavioural theory is used to illustrate the role of civil servants in public organisations. First, the different approaches to organisational theory are discussed. Further, organisational behaviour, specifically the role of civil servants in public organisations and the implications of the publicness of organisations is explained.

2.1 ORGANISATIONAL THEORY

Organisations are entities that work in a structured way, often with several smaller departments and units. For an organisation to perform well, its people must work effectively and produce valuable output (Rainey, 2005). Public organisations seek to better the lives of citizens by providing services such as mobility, pedestrian-friendly environments, or sustainable land use. Hence, public organisations create and deliver pivotal services to citizens (Rainey, 2005). The management and organisation of service delivery and output are essential as their outcomes directly affect citizens (Boyne, 2002). Civil servants working in public sector organisations contribute to shaping and implementing public policy. The literature on attitudes and behaviour of civil servants discusses people's values and motives specific to the fields of general organisational management and organisational behaviour (Rainey, 2005). Human motivation is typically interrelated with factors like organisational structures and processes, organisational culture, and leadership. Thus, civil servants' attitudes and motivation are shaped by internal corporate mechanisms and characteristics of the organisation's environment (Rainey, 2005). While internal organisational factors focus on leadership, salary, and the nature of work, environmental factors include the organisation's culture and external criteria such as the management of stakeholders and political authority.

2.2 THE CONCEPT OF PUBLICNESS

One of the key disputes in the literature on public administration is the distinction between public and private sector organisations. Some authors sustain that public and private organisations and the people in those organisations must be studied differently since they differ in their work motivation (Rainey, 2005; Feeney & Welch, 2012). While the collective taxpayer

owns public organisations, private organisations are owned and managed by private individuals or enterprises. Businesses are usually driven by profit maximisation and focus on entrepreneurial activities. Public organisations often have abstract, multiple, and conflicting goals, such as the efficiency of service delivery, equality of services and responsiveness to citizens. The delivery of public services has the ultimate goal of bettering the lives of citizens and creating public value. Authors arguing for the differences in studying public and private organisations and the people in them sustain that public and private employees differ significantly in their work motivation.

From the work environment dimension, public organisations are inherently dynamic and complex. Civil servants' work often involves the management of multiple different stakeholders and conflicting interests (Boyne, 2002; Rainey, 2005; Levine et al., 1975). That includes, e.g., the external supervision from political authorities, civil service rules and pressure stemming from spending taxpayer's money responsibly and effectively.

Public administration scholars thus argue that public sector employees differ in their attitudes and behaviour, having different underlying ideas and assumptions concerning their job than their private counterparts. Boyne (2002) differentiates between three dimensions of publicness that affect organisational behaviour: Common ownership, reliance on public funding and control of the political authority. Following economic theory and concerning property rights, the literature on public organisations assumes that civil servants, unlike their private counterparts, do not benefit from better performance because their salary is not dependent on financial success rates (Boyne, 2002). Specifically, public managers do not profit directly from better organisational performance. Thus, they are assumed to be unresponsive to economic control but instead work under the scrutiny of political authority (Bozeman et al., 1992). The literature review suggests a closer study of civil servants' attitudes and behaviour.

Rational choice theorists like Olsen (2015) and Kahnemann and Tversky (1979) argue that individual behaviour is predictable and can be modelled with expectancy behaviour models. One of the most prominent advocates of rationality in behavioural public administration is the economist and political scientist Herbert Simon (1998). Herbert Simon (1998) majorly contributed to the field of Public Organization Theory with his theory of civil servants' 'satisficing', a variation of the principle of utility maximisation. He argues that practices, processes, and work motivation do not differ between public and private organisations. Instead, goals and motivational attitudes are the same for all types of organisations: "[…] human self-interest explains only partially what goes on in government – and for that matter, in business firms as well" (Simon, 1998, p. 4). Brewer (2003) contests the proclamation of

disregarding the difference between public and private employees in studying people in organisations. Besides others, his findings suggest that public servants are more 'civic-minded' than other citizens. For example, civil servants are more likely to perform community and social services (voluntarism) than private employees. Mergel and Desouza (2013) note that *"[i]nattention to substantive differences between private and public sector practices may lead to failures in implementing [a] new policy instrument"* (Mergel & Desouza, 2013, p. 883). To acknowledge differences in the study of civil servants and private employees means incorporating the dimension of the organisation's environment and attitude differences in the study of civil servants' behaviour. Between all differences and disputes within the discipline, the different traditions of Public Organization Theory agree that understanding individual behaviour and the underlying work motivation of employees is crucial to studying organisations and organisational behaviour.

2.3 PARTICIPATION

Democracy thrives on participation, and citizen participation is the foundation of our society. Participation is about citizen power and strengthening the legitimacy of political decisions (Nanz & Fritsche, 2012). The installation of participation structures allows citizens to articulate different interests and opinions. Participation structures encourage citizens to support political decisions and strengthen trust in the work of civil servants and the government (Nanz & Fritsche, 2012; Spyra et al., 2019). A public administration that solely concentrates on efficiency and effectiveness cannot provide the means for a democratic society (Callahan, 2007). Hence, the challenge for the governments is to balance democratic values like fairness, equity, and participation with responsiveness and efficiency (Box, 1998). Callahan (2007) contends that balancing efficient and logical service provision with open and democratic processes is ideal and one of the governments' most challenging and essential tasks. Citizen participation allows citizens to influence the decision-making processes of the government administration (Callahan, 2007). Although there is consensus on the importance of public involvement, the form and level on which to include citizens in participatory processes remain contested among scientists (Day, 1997; Callahan, 2007). When deciding how to involve people, public administration also decides on what level the engagement takes place (Arnstein, 1969). On the most basic level, participation provides citizens with information via posters, websites or informative events (Urban Workshop, 2022). Nevertheless, public planners can also consult citizens via polls, use citizen forums or panels, or organise collaborative activities such as citizen workshops to engage with people.

2.3.1 Participatory Planning

Choosing a suitable form of engagement is essential for public managers in participatory planning processes. Participatory Planning (PP) refers to all participation activities organised by civil servants (public planners) in the context of urban-land-use and spatial planning projects. PP is becoming increasingly complex and context-dependent (Spyra et al., 2019). Traditional forms of involvement include activities such as organised walks through the neighbourhood, citizen forums, public hearings, exhibitions, and information documentation. Though, conventional methods of participatory planning reach their limits when the scope is to address certain demographic groups of the population (Bouzguenda, 2021; Fredericks et al., 2019). People working late, with two jobs, or lacking time to reach participatory events are underrepresented in conventional PP events. Those citizens' feedback, ideas and opinions are usually not reflected in the participation process. Hence, providing the means and gateways for more representativeness and diversity of participants in PP presents a prevailing challenge for public administrators.

2.3.2 Digital Participatory Planning

Digital participatory tools have attracted considerable interest among local governments for stimulating community discussion and public engagement. Digital citizen participation is defined as *"[…] technology-mediated interaction between the civil society sphere and the formal political sphere"* (Sanford and Rose, 2007, pp. 408). Digital tools can contribute to more effective use of input in participatory planning by enriching the sense-making capabilities of local governments and civil servants working in them (Afzalan & Muller, 2018). Beyond the hype culture around digital tools in PP, those tools can improve government-citizen understanding by providing valuable insights into citizens' needs (Clarke & Margetts, 2014). Therefore, the profusion of information provided by big data enables public sector organisations to align their services with citizens' needs towards providing better-informed services, improved public programs, and citizen responsiveness (Mergel et al., 2019). In the environment of big cities, the variety of different DPPT contractors offer is enormous. The DPP toolbox includes technologies such as Web 2.0 applications (Fredericks & Foth, 2013; Mergel & Desouza, 2013), online citizen forums (Afzalan & Muller, 2018), 3D virtual collaborative planning tools (Zhang et al., 2019), and GIS-based planning tools (Lieven, 2017, Pánek, 2019). While the methods of participation primarily focus on informing and engaging with citizens, co-creative approaches such as living labs seek solutions working together closely with citizens (Mulder, 2015). However, the number and variety of digital tools do not equal usage by the civil servants in local district planning. Mergel et al. (2019) describe this phenomenon as the 'public sector paradox'. Meaning that while, on the one hand, digital tools have an enormous potential

to contribute to public sector transformation and innovation when it comes to transparency and accountability issues, on the other hand, the administration must deal with internal and external restrictions associated with bureaucratic red tape (Mergel et al., 2019; Fredericks & Foth, 2013). Balancing these different environmental and bureaucratic constraints is one challenge for public planners deploying DPP.

2.4 ADOPTION OF DIGITAL TOOLS IN PARTICIPATORY PLANNING

2.4.1 Civil Servants and Technology

This section explores the relevance of civil servants' attitudes in studying digital tool adoption in PP. The process of innovative technology adoption in governments is commonly treated in the social sciences. While diffusion theory concentrates on the number of adopters of technology, tracking the number of users takes a systematic organisation-centred approach to integrate new technology. Adoption theories emphasise the individuals' decision-making level in organisations adopting new technology (Mergel & Desouza, 2013). As with other government innovations, the digitisation of participatory planning provides opportunities and challenges for leaders, managers, and professionals in government. Civil servants and public managers shape participation processes and determine whether and how public input impacts decision-making (Moynihan, 2003). Therefore, civil servants' attitudes influence the participation process substantially.

The perspective of civil servants matters because by creating barriers or providing access to participation, public planners influence the decisions of citizens on whether they participate in decision-making processes. Moynihan (2003) identifies factors likely to influence civil servants' attitudes and connects them to the efficacy of participation outcomes. Therefore, civil servants evaluate administrative costs of participation differently depending on the perceived project benefit of participation outcomes. In contrast, perceived participation costs are, for example, the potential of engagement processes to slow down the decision-making of a particular planning project. These concerns also come from the fear of not reaching a consensus (Moynihan, 2003). Moynihan (2003) sustains that by *"[…] 'reeducating' public administrators or by adopting new modes of participation, […] existing incentive structures and methods of participation are changed"* (Moynihan, 2003, p. 165). He argues that public managers being critical of citizen participation and the quality of public management profoundly affect participation outcomes. As a result, local administrations have experimented with a wide range of instruments to enhance citizen involvement in the policymaking process and implementation of policies. These include interactive policymaking, deliberative forms as well as digital participation.

2.4.2 Technology Acceptance Model (TAM)

Successful implementation of new technology in the public sector can lead to enhanced public service provision and better the quality of participatory processes. However, failure to implement new technology can lead to resistance to new technology and dissatisfaction among public servants (Mergel & Desouza, 2013). Thus, in the context of digital participatory planning, new tools and technology find application in PP practice if practitioners find the system easy to use and consider it to add value to the participatory planning process.

To investigate users' behavioural intentions, Davis et al. (1989) developed a user prediction model, the Technology Acceptance Model (TAM). TAM is one of the most widely used models in psychology and information system literature to predict ICT usage and has been tested empirically in several studies (Belanche et al., 2012; Vonk et al., 2007). The model was developed and adjusted from the Theory of Reasoned Action**,** which explains the relationship between attitudes and behaviours within human action**.** It is mainly used to predict how individuals will behave based on their existing attitudes and behavioural intentions (Fishbein & Ajzen, 1977). The individual's attitude towards using determines the intention to use a new system or tool. The model is based on two concepts, *perceived ease of use* and *perceived usefulness*, determining the individual's *behavioural intention to use technology* (See Figure 1**Fehler! Verweisquelle konnte nicht gefunden werden.**). The concept of *perceived usefulness* is influenced by *perceived ease of use*, stemming from the reasoning that the more accessible a tool is, the more valuable it can be (Venkatesh, 2000). The first construct, perceived ease of use, is the extent to which an individual believes that utilising a tool will be effortless (Davis et al. 1989). The other construct, perceived usefulness, is the extent to which an individual believes that utilising a tool will enhance her productivity (Venkatesh, 2000).

Based on behavioural decision theory represented by Kahneman and Tversky 1974, Venkatesh (2000) derives so-called 'anchors' (from now on, referred to as criteria) to influence the concept of perceived ease of use. He suggests that persons rely on three anchoring beliefs when judging a new technological tool to its usefulness: (1) prior experiences, (2) context and background, and (3) stimulus. Prior experiences set the baseline for an individual's beliefs about a tool. They are expected to adjust their beliefs about the ease of use of a tool when confronted with context-specific information, like training and learning opportunities (Venkatesh & Davis, 1996). This study uses an adapted version of the TAM to explain the relationship between civil servants' attitudes and the adoption of digital tools in DPP practice.

2.4.3 TAM and Civil Servants' Adoption of DPPT in participatory planning practice

This study uses the TAM to analyse civil servant behaviour towards adopting digital tools in PP. The theme of perceived ease of use is influenced by the previously identified criteria *experience* and external stimuli (from now on, referred to as *training*) (Venkatesh & Davis, 1996). The theme of perceived usefulness relates to perceived usefulness, hence perceived costs and benefits (*usability*) of a tool and trust in citizens' ability to use DPPT and make valuable contributions to planning projects. Four sub-criteria have been identified from the literature to affect the behavioural intention of civil servants to use digital tools PP: Experience, training, usability, and trust (See Figure 1).

Experience

Experience relates to the theme of perceived ease of use. It encompasses all practical before-hand experience of civil servants in using and deploying digital tools in PP projects. Differences in technical experience and background among practitioners lead to diverse prerequisites for deploying DPP in practice. Regarding access to technology, Slotterback (2011) suggest that civil servants differ in their capacities to use technologies. The researchers conclude that civil servants focus more on digital tools that enable the provision of information, for example, websites informing about a project for reasons of technical capacities. Thus, civil servants consider using interaction and discussion, enabling digital tools less often (Slotterback, 2011). However, this trend might be counteracted by additional experience with the system: "*With increasing direct experience with the target system, individuals adjust their system-specific perceived ease of use to reflect their interaction with the system"* (Venkatesh, 2000, p. 343). Thus, civil servants with before-hand experience with DPPT are more likely to consider advanced digital tools in DPP.

Training

The prerequisites for digital participatory planning must be known by the civil servants and trained before carrying out DPP. Nochta et al. (2020) identify a need for practitioners and public planners to understand better the functioning and the boundaries of data-driven participatory tools in terms of opportunities, limitations, risks, and uncertainties (Nochta et al. 2020). In addition, civil servants need the know-how to interact with new technology to approach DPP in a socially sustainable way (Bouzguenda, 2021). One way of understanding a new tool is through acquiring theoretical knowledge and training to meet civil servants' potential fears and concerns (Zaman et al., 2021). Those fears can be related to the technocratic part of adopting digital participation tools. Extra work might be required to acquire new competencies and deal with unforeseeable challenges.

Trust

Trust is related to the theme of perceived usefulness in the TAM influencing the intention to adopt the technology. Trust issues are one of the main barriers to genuine involvement (Laurien & Shaw, 2009). *Trust* means civil servants' belief in citizens and their abilities to contribute valuable information to the planning process*: "[P]articipatory processes can seek to promote different goals simultaneously"* (Laurien & Shaw, 2016, p. 296). It is thus not only a question of the training or experience of the project planner but also her attitude towards the aimed level of citizen engagement. The willingness and attitudes of civil servants toward citizen participation are rooted in felt trust by several authors (King & Stivers, 1998; Yang, 2005). High levels of trust enhance the relationship between public administrators and citizens. It increases the inclination of public planners to embrace civil servants' contributions in their decisions. Especially in the context of DPP, trust is crucial to enhance the participation of different demographic groups. The demographic characteristics of participants are diverse, and access to technology differs in city districts (Slotterback, 2011). Thus, local engagement strategies should mirror that in their digital participatory planning processes.

Furthermore, trust is mutual. Rahn (1997) finds that people who can trust others are themselves more trustworthy. Thus, civil servants with a positive attitude towards citizens' engagement are considered more trustworthy. Hence, civil servants' trust in citizens' ability to make valuable contributions online or via digital tools might influence their intention to use DPPT.

Useability

Usability is related to the theme of perceived usefulness. Introducing DPPT to the participatory planning process creates opportunities and difficulties for public administrators. Technology acceptance and confidence in using digital tools, such as GIS-based spatial planning tools, project websites and survey tools, varies significantly among civil servants (Guenduez et al., 2020). Several reasons exist local government organisations are hesitant about using DPPT in practice. One reason is the many potential pitfalls of the (mis-) use of data and data management systems. There are concerns regarding privacy, access, information policies, and how personal data are managed, curated, and preserved (McNeely & Hahm, 2014). Despite the availability and felt ubiquity of technology, civil servants remain sceptical about the added value of adopting DPPT in practice. Especially digital tools that run on spatial and big data are often highly technical and thus presume advanced digital know-how (Slotterback, 2011). Guendez et al. (2020) find that widespread scepticism towards digital tools among public managers is a defining reason for practical use of big data in the public sector remaining

very limited. GIS-based participation tools are not promoted enough towards public managers and are thus adopted less. Guenduez et al. (2020) state *"[…] that public organisations' uncertainty about whether and how to implement big data arises from public managers' very different opinions, expectations, assumptions, and understandings about uses of big data in public administrations"* (Guenduez et al., 2020, p. 2).

Vonk et al. (2007) argue that change must happen from the individual level, hence from the bottom-up: *"Many managers and planners are hardly aware of the existence and potential of many geo-information technologies"* (Vonk et al. 2007, p. 752). Their findings suggest that technology adoption is an informal process that depends on an organisation's learning and knowledge distribution culture. From another viewpoint, researchers argue that more basic technologies that provide information like websites are perceived as more straightforward to use by planners than advanced technology, like spatial planning tools (Slotterback, 2011). Therefore, these technologies risk potentially excluding planners and citizens because they are too advanced in terms of technicalities. Moreover, the handling and adoption of new digital tools require additional *resources*, such as training, personnel, and time: *"Plans are often prepared under severe constraints on time and technical resources, including those of available staff"* (Sager, 1981, p. 418). Therefore, concerns of lack of time and resources potentially prevent planners' from deploying advanced participation tools in DPP.

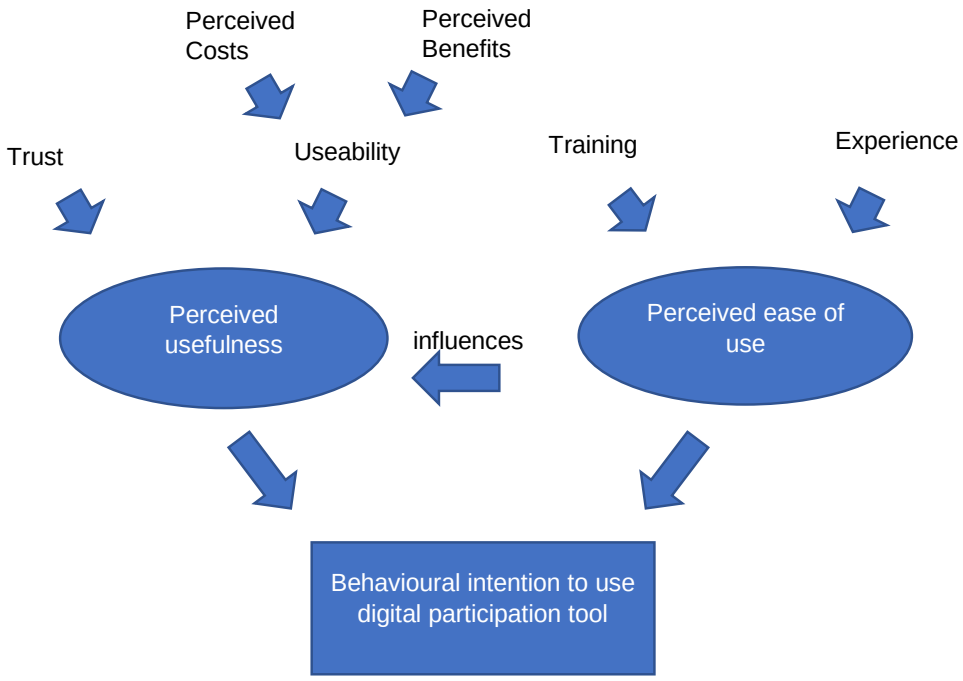

Figure 1 Technology Acceptance Model adapted from Davis (1989)

3. METHODOLOGY

This section explains the methodological approach of the study, the research design, the case study selection, the sources of the collected data, and the form of data analysis.

3.1. RESEARCH DESIGN

This study investigates the relationship between civil servants' attitudes towards technology and the adoption of DPPT in participatory planning processes in the local district departments in the city of Hamburg. The first two sub-research questions are descriptive; the second two research questions have an explanatory character.

To answer the primary research question '*How do civil servants' attitudes influence the adoption of DPPT in local district participatory planning?*', a case study research approach was chosen. Case studies usually follow qualitative or mixed-method approaches. Case studies test or develop theories and understand and define new phenomena or concepts. George and Bennett (2005) define a case as *"[…] an instance of a class of events"* (George & Bennett, 2005, p. 24). The concept 'class of events' is referred to as a phenomenon of scientific interest. One of the main concerns of research, but qualitative research and case studies especially, is the degree to which findings can be generalised. Hence, findings should apply to different contexts and situations: *"[E]mpirical generalisation is possible when the case, or cases, are in some way demonstrated as representative of the population"* (Flick, 2014, p. 53). One advantage of case studies is *"[…] their potential for achieving high conceptual validity, […] and their capacity for addressing causal complexity"* (George & Bennett, 2005, p. 25). Complexity applies to concepts of the social sciences, such as political trust, democracy, or political acceptance. Case studies further focus on contemporary events (Yin, 2018).

Case studies, especially in combination with interviews, are approved research methods in public administration research and studying public servants' behaviour. This research design enables the close study of people's meanings, attitudes and intentions and connects them to the social world. A renowned example is Lipsky's (1980) study of street-level bureaucrats, such as policemen or teachers. In this thesis, semi-structured interviews were conducted to explore the attitudes of public managers toward technology and DPP, particularly in the district planning departments of the German City Hamburg. Semi-structured interviews allow the respondents to discuss and raise issues that are otherwise not considered (Miles et al., 2018). Thus, this method is feasible to understand how attitudes relate to a particular behaviour in the context of DPP processes.

3.2 CASE SELECTION

Hamburg is chosen as a case to investigate the phenomenon of civil servants' attitudes towards the adoption of DPPT in PP processes. The case of Hamburg is especially fruitful for investigating the adoption of technology among public servants for several reasons.

First, Hamburg is one of the most progressive cities in participatory planning technology, both as a developer and deployer of participatory software in Germany (Transparency Ranking Germany, 2022). With 1.8 million inhabitants, Hamburg is the second biggest city in Germany. The size of the city and the diversity of the different city districts makes it a fascinating study subject in terms of the adoption of new innovative technology by civil servants in different local district governments. Hamburg further has two distinctive features in its regulatory landscape that accelerate the development of integrative and digital innovative solutions in PP. First, Hamburg has central coordination for participation, the so-called ‘Urban Workshop' (from now on, STW), a sub-unit of the Hamburg Ministry of Urban Development and Housing. The agency's primary objective is to promote (informal) participatory planning and aims to enhance participation in PP processes. Secondly, Hamburg has set a focal point on the digitisation of services and developed an integrated approach to promoting digital technologies in all areas of urban life for this purpose. 2019 first formulated and 2020 updated Hamburg Digitization Strategy (2020) aims to establish a (local) participatory planning culture supported by digital tools to overcome participation barriers and make participatory planning transparent and inclusive (Digital Strategy Hamburg, 2020). The strategy encompasses all information and PP processes beyond formal public participation regulated by the Hamburg Building Code. In this context, spatial DPPT, such as the Geographic Information System (GIS)-based planning tool DIPAS is promoted amongst the public and private practitioners as a viable solution to participation issues, such as representativeness, usually encountered with conventional participation forms (Lieven, 2017). The use of DPPT in PP processes promises enabling increased transparency and efficiency of citizen engagement.

The MDH has been building up a digital planning infrastructure for several years based on various pilot projects adding to the city planner's toolbox of DPP, such as the planning tool COSI or the currently developing project of the data platform Connected Urban Twins (Urban Workshop, 2022). The DIPAS tool is the result of one of these pilot projects. DIPAS is a GIS-based spatial planning and participation tool. It has been piloted in Hamburg in projects like the development of the Grasbrook in Hamburg-Veddel or the urban development strategy project in Hamburg-Bergedorf. Depending on the project, citizens can vote, comment, and make suggestions on the respective platform online and on-site (See APPENDIX C). Based on the publicly provided data of the Urban Data Platform Hamburg, the integrated digital map

enables the mapping of citizen proposals, ideas, and discussions. The tool has been piloted in Hamburg's districts since 2017 and has been open-source since February 2021. Currently, the cities of Leipzig and Munich are piloting DIPAS, uploading their cities' digital infrastructure data to the software (DIPAS, 2022).

DIPAS presents one of the newly developed tools of which the ownership lies entirely in the hands of the city. After cities like Barcelona guided the way in implementing intelligent city planning technology, the deployment of DIPAS in Hamburg presents the first public development of a geospatial data-powered digital participation tool. The challenge for metropoles like Hamburg is the diffusion of DPPT know-how among civil servants in all city districts that often differ in terms of their demographic characteristics. Thus, this case study concentrates on civil servants' behaviour towards adopting digital tools in PP at the local district level.

3.3 DATA COLLECTION

Data is collected through semi-structured expert interviews with civil servants from various district urban planning departments. In total, five interviews were conducted (See APPENDIX B). Table 1 provides an overview of information about the respondent's characteristics. 60 per cent of respondents were male and 40 per cent female. All interviewees are project managers in their respective district departments. The interviewees were from the Department of Strategic Planning Hamburg-Mitte, Department of Management of Public Space Hamburg-Altona, Department of Urban and Landscape Planning Hamburg-Altona, and the Department of Urban and Landscape Planning Hamburg-Bergedorf. In addition, 60 per cent of interviewees have a background in urban planning, 20 per cent of respondents have graduated in Geography, and 20 per cent have a degree in sustainability sciences. Furthermore, a project manager of the MDH that forms part of the development team of the DIPAS tool was interviewed.

Table 1

Sample breakdown of the semi-structured interviews (n=5)

Gender		Position	District	Background
M	F			
	X	Project Manager, Ministry of Urban Development and Housing of Hamburg, STW, Connected Urban Twins Project	Ministry	Studies in Urban and Regional Planning, Studies in Planning and Participation

X		Project Manager, Department of Strategic Planning Urban Land-Use Planning	Mitte	Strategic Planning District Office Altona
X		Project Manager, Department of Management of Public Space, Project freiRaum Ottensen	Altona	Global Sustainability Science, Business Developer, Climate- and Mobility Management
	X	Project Manager, Department of Urban and Landscape Planning, Strategic Planning, Project Climate Concept Altona	Altona	Graduate engineer, city and landscape Architect, Studies in Urban Planning, Research Associate
X		Project Manager, Department Urban and Landscape Planning, Strategic Planning, Project Moorfleet	Bergedorf	Studies in Geography
Total	3	2		

The respondents were contacted via e-mail. All respondents were sent an interview guide and information about the research project. Respondents' consent to the interview was ensured via an informed consent declaration sent out and signed by all respondents before conducting the interviews. Table 2 provides an overview of example interview questions related to the identified themes and criteria. This thesis also aims to discover more about civil servants' general attitudes towards technology. Therefore, the interview guide includes questions with scales on which interviewees indicated their level of confidence with different technologies related to DPP, such as social media, big data, AI, and DPPT, ranging from 1 (very confident) to 6 (not confident) (See APPENDIX A).

Table 2

Examples of interview questions with related themes and criteria

Theme	Criteria	Interview Question
Perceived Ease of Use	Experience	How familiar are you with DPPT?
		Are you currently planning a DPP?
	Training	Have you participated in the Digital Participation System (DIPAS) training/ courses/ workshops?
Perceived Usefulness	Useability	Do you think that all PP should take place online? If yes, why / If no, why not?

	In your opinion, what are the driving/restricting factors for implementing DPP in your district?
	In your opinion, what are the advantages and/or disadvantages of digital participation formats?
Trust	Where do you see challenges in using DIPAS in district participatory planning?
	Have you encountered resistance to DPP from citizens?

Interview questions were developed to reflect the distinctive themes aiming to answer the research questions of this study (See Table 3). Thus, interview questions were formulated open to allow respondents to elaborate on thoughts and responses (Bazelely, 2013). The expert interviews were conducted, recorded, and transcribed in German to preserve better the dialogue's quality (Bazeley, 2013). An overview of conducted interviews is presented in APPENDIX B. The interviews were transcribed following Dresing and Pehl's (2015) method of simplified transcription. All interview data were anonymised. The data from the interviews were analysed using the data analysis software ATLAS.ti.

Table 3

Criteria with related sub-research questions

Criteria	Sub-research question
Experience	What are civil servants' attitudes towards technology?
Usability & Trust	What are civil servants' attitudes toward the useability of DPPT in participatory planning?
Experience	How does civil servants' experience with DPPT affect their decision to opt for a digital or conventional approach in participatory planning?
Training	How does DPPT training affect civil servants' decision to opt for a digital or conventional approach in participatory planning?

3.4 DATA OPERATIONALISATION AND ANALYSIS

The applied method of data analysis is a thematic content analysis of interview transcripts. Thematic content analysis is used to systematically describe the meaning of data (Schreier, 2015). The method allows the researcher to direct her focal point on selected aspects of meaning that relate to the general research question. Henceforward, pieces of the transcript were assigned to criteria identified in the literature review (Table 4). The number of aspects is ultimately limited to the number of themes or criteria. Schreier (2015) calls this type of analysis

"[…] abstracting from the specific" because one criterion covers specific passages conveying a particular meaning (Schreier, 2015, p.170). The thematic content analysis enables the comparison and relation of different parts of transcript material. The difficulty with the content analysis is ensuring that the analysis is always data-driven, meaning that the categories fit the data accordingly (Schreier, 2015).

Table 4

Factors related to the behavioural intention to use digital tools in participatory planning

Criteria	Source
Experience	Nochta et al. 2020; Venkatesh, 2000
Training	Zaman et al. 2021
Usability	Sager, 1981; Slotterback, 2011
Trust	Guenduez et al., 2020; Laurien & Shaw, 2016; Clarke & Margetts, 2014

Coding is a content analysis tool for querying data to test assumptions. For the interview data analysis, concise definitions were developed for each criterion and sub-criterion and organised in a coding frame (See Table 5). Coding is essentially assigning a label (code) to a passage of data based on the researcher's understanding of the meaning of that passage (Bazeley, 2013). Hence, coding is not a mechanical task but depends on close working with the meaning of the text. Nevertheless, the method is feasible for analysing behaviour and attitudes because it allows for developing alternative ways of understanding, framing, and interpreting textual data (Bazeley, 2013). Respectively, the coding frame with (sub-)criteria guides the analysis (See Table 5).

The analysis of the interview data was conducted as follows. First, the interview data was organised, cleaned, and uploaded to the ATLAS.ti software. Then, in a second step, the data was reorganised into 'codes' (criteria) related to the sub-research questions. Next, the relevant information from interview responses was coded to the associated theme 'code'. A network of codes was built to visualise the data and present an overview of the frequency of codes applied using the software ATLAS.ti (See Figure 2).

Table 5

Coding frame with coding rules related to the (sub-)criteria

Criteria	Sub-criteria	Description	Coding rule

Experience		Experience is all prior practice related to DPP.	
	Self-Efficacy	Self-efficacy is related to the criteria experience and describes the level. of confidence of the civil servant to use DPPT.	Code when respondent refers to feeling comfortable with DPPT.
Training	No training, training	Training is all DPPT skill-enhancing training attended for carrying out a DPP or using DPPT.	Code, when respondent refers to (not), received DPPT training
Usability		Usability refers to whether civil servants perceive DPPT as adding value to the participation process.	Code when respondent talks about the value of digital tools or DPP in general.
	Costs	Costs are defined as civil servants' perceived costs of adopting DPPT tools in PP processes. This also relates to scepticism towards DPPT.	Code when the respondent refers to costs experienced or associated with the deployment of DPPT in PP (e.g., time, money, personnel).
	Benefits	Benefits are defined as civil servants' perceived benefits of adopting DPPT tools in PP processes.	Code when the respondent talks about benefits she experienced or associates with the deployment of DPPT in PP
Trust		Trust is defined as civil servants' trust in citizens' ability to properly use DPPT and contribute valuable information to the planning project.	Code when respondent refers to citizens' trust or scepticism in DPP projects and

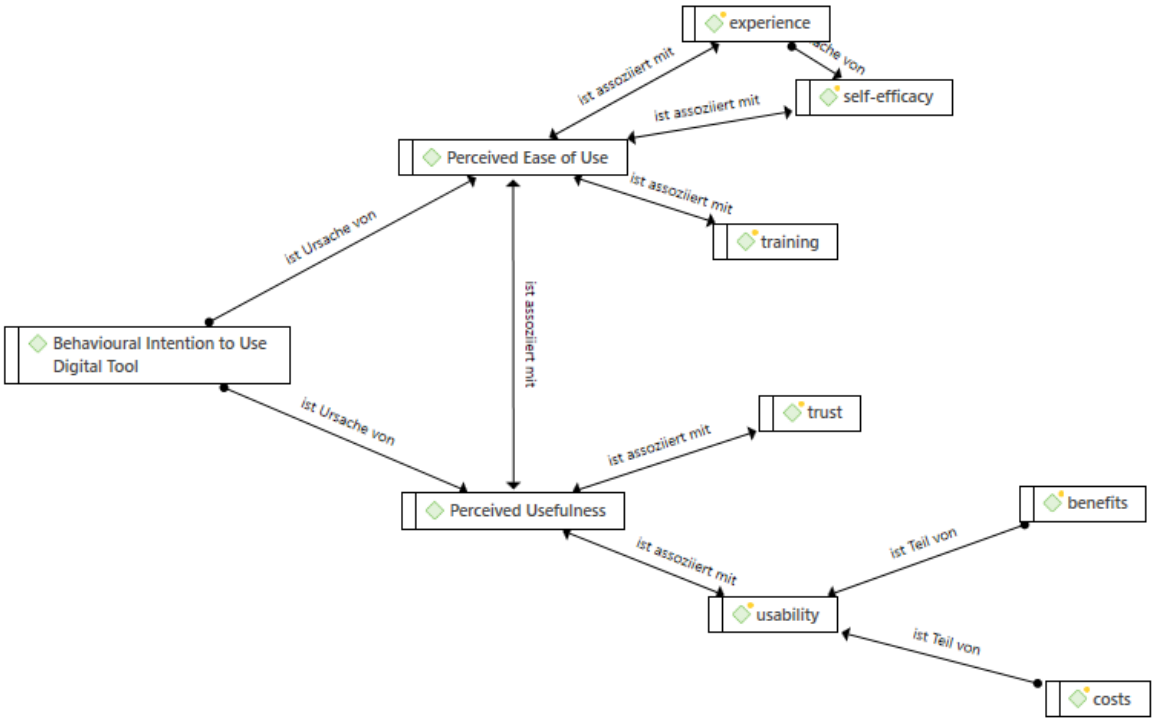

Figure 2 Network view of code relations in Atlas.ti

4. ANALYSIS

In this section, the findings are analysed sub-research question by research question following the themes and criteria previously identified in the literature (See Table 3). Subsequently, each research question is answered at the end of each sub-section. Finally, for the themes and criteria analysis, the related qualifiers from the interview data are presented (See Table 8).

4.1 CIVIL SERVANTS' ATTITUDES TOWARDS TECHNOLOGY

In this part of the analysis, sub-research question (1) is answered by analysing civil servants' attitudes towards technology using the interview data related to the criterion experience (See Table 8).

Civil servants' attitudes towards technology are influenced by their prior experience with technology. Their intention to use is influenced by prior experience with technology and digital tools. Respondents have different associations with technology and range in their subjective judgment of familiarity and confidence with the use of technology (See Table 6). For example, 40 per cent of the interviewees feel confident using big data-powered technology like the urban data platform or artificial intelligence (AI) guided systems like augmented reality neighbourhood walks (Interview 1). However, 60 per cent of respondents do not feel comfortable with AI. Either because they have not interacted with AI or do not feel they have enough know-how to judge their competence with AI tools (Interview 5).

On the other hand, 100 per cent of respondents feel very confident using social media. Social media is a communicative and intuitive tool. According to an evaluation by the Federal Statistical Office, 61 per cent of the internet population in the 10 to 15 age group participate in social networks for private communication. Between 16 and 24 years, it is already 89 per cent and between persons of 25 and 44 years, 73 per cent (Statista, 2022b). The results on DPPT show that 60 per cent of respondents feel very confident using digital tools, while 40 per cent feels at least confident in using DPPT in participatory planning.

Table 6

Level of confidence of civil servants towards technology

Technology	Percentages of Level of confidence		
	Very confident	Confident	Not confident
Social Media	100	0	0
Big Data	40	40	20
Artificial Intelligence	0	40	60
DPPT	60	40	0

Attitudes towards technology are a fuzzy concept. Thus, the research question 'what are civil servants' attitudes towards technology' is partially answered by the above results. Most respondents feel comfortable using standard technology such as social media, which they use in their daily lives and DPPT. Although here, a difference must be made between digital tools such as low-threshold project websites or online presentations and more advanced participation tools like DIPAS that require more extensive knowledge.

4.2. CIVIL SERVANTS' ATTITUDES TOWARD THE USEABILITY OF DPPT IN PARTICIPATORY PLANNING

This part presents the results related to the sub-research question (2). Hence, this section elaborates on the findings related to the relationship between civil servants' attitudes and their perceived useability of DPPT in PP practice.

Adopting DPPT in the planning practice requires training to initiate cultural change inside the organisation and behavioural intention of civil servants towards adopting DPPT in informal participatory planning. While the base for learning and advanced experience with digital tools are resources, the improvement and perceived usefulness of DPPT is influenced by civil servants' experience with DPP in practice.

80 of the respondents think that DPP provides additional value to the participation process. Out of these, 60 per cent of interviewees sustain that DPPT can enhance the quality of PP, offering the possibility for usually silent groups to articulate their opinions online or via a chat function (Interview 1, 2, 4). Citizens who do not feel comfortable in real-live events instead participate online. Furthermore, people who do not have the time because they work double shifts or nights or because they do not live close to the place of the PP event can participate using the online options (Interview 1). However, respondents remark that the people participating most are the ones that are directly affected by the planning. Hence, people who live in the area of planning or stakeholders with interest in the development of a particular place (Interview 3).

All respondents report having deceived expectations regarding the total number of people taking up the online offers (Interviews 2 & 4). Costly hybrid events narrow the enthusiasm of planners about digital tools when the response rate of participants online is low.

> *'At the end of the day, you need formats that are appropriate to the target group for meaningful participation. And in our experience, the online approach works for many. Not for everyone. Then you also need alternatives for this accordingly.' (M3)*
>
> (Interview 3, p. 6, l. 26ff.)

The interviewees generally state trust in citizens' ability to use digital tools, although they do not view them as the single solution to more comprehensive engagement (Interviews 4 & 5). Interviewees reporting from DPP with relatively low numbers of online participants underline the assets of DPPT to contribute to an overall more comprehensive PP in terms of providing low-threshold participation opportunities for a wider audience (see Table 8). Unsatisfactory

outcomes of DPP are attributed to factors such as missing communication of the event or advertising it more in the district community, and not as a deficit of DPPT per se (Interview 3).

> *'Our goal is to engage in a dialogue with as many people as we can and to collect as many opinions and ideas as possible. Digital tools are simply very well suited for that aim.'*
>
> (Interview 4, p. 16, l. 29f.)

60 per cent of respondents declare to incorporate DPPT in their planning decision independent of prior experiences with low numbers of online participants (Interviews 4 & 2). All interviewees stress that deciding to opt for a DPP or a conventional approach is context-dependent. Considering the target group, background, and place of a PP project are seen as crucial to the success and comprehensiveness of PP (Interviews 1,2,3,4). 20 per cent of respondents underline that in PP, where there is an extremely high possibility of conflict between parties from the very beginning, digital tools could only do so much to support the participation process. In this case, analogue forms of dialogue and mediation between different stakeholder groups are considered an adequate option (Interview 5).

The analysis to answer the sub-research question (1) followed the theme of civil servants' perceived useability of DPPT and trust in citizens' capability to use digital tools. The results suggest that civil servants find DPPT add value to the participation process. Further, interviewees trust citizens to use DPPT and engage online, although some respondents mistrust the capabilities of older people to use more advanced DPPT in projects.

4.3 THE EFFECT OF CIVIL SERVANTS' ATTITUDES ON THEIR DECISION TO ADOPT DPPT

This section presents the results of the findings related to the sub-research question (4), hence the effect of civil servants' attitudes on their decision to opt for a conventional or digital PP approach.

All respondents have had prior experience with DPPT in different contexts of their work. Three different usages of digital tools in DPP were identified: information tools, interaction tools, and the GIS-based spatial planning and participation tool DIPAS. Respondents' experience with the different DPPTs is presented in Table 7. Information tools present the less technical level of DPP. All interviewees have had experience with information tools like project websites or digital presentations. In addition, 40 per cent of respondents reported having had experience with interactive DPPT, such as hybrid participation events with an interactive chat and survey

tools as accompanying features. Finally, 60 per cent of respondents stated to have extensive experience with the DIPAS tool in local PP projects.

> *'I work with the tools COSI and DIPAS, and I feel confident working with them. But nevertheless, using them is a means to an end for me. It is not that I use digital tools with great enthusiasm. However, I keep working with them because I think that it brings better results for PP than not using them.'*
>
> (Interview 4, p. 16, l.51ff.)

All respondents have experienced the concurrent use of DPPT in participation processes as positive and enriching. However, one respondent reported to have faced considerable scepticism towards DPPT in the circle of colleagues in the district department (Interview 2). Although after carrying out the DPP project, colleagues and the respondent remained positively surprised by the experience. However, the respondent perceived the organisation and deployment of the DPP event as technically challenging (Interview 2).

Self-efficacy and confidence with technologies is one factor that contributes to the adoption of DPPT by civil servants. 80 per cent of respondents report positive and negative experiences with DPPT. For example, one respondent carrying out a DPP with DIPAS reported low numbers of participants and relatively high resources costs, such as time-intense preparations and technical personnel to carry out the DPP (Interview 3). Overall, the accompanying adoption of DPPT in participatory planning processes is perceived as an asset to conventional participation methods.

Table 7

Civil servant's experience with DPPT in percentage

Level of participation in DPP	Percentage Experience
Information (e.g., project website)	100
Interactive (live-hybrid event, chat, survey)	40
Interactive Spatial GIS-based tools (DIPAS)	60

Overall, experience is decisive in civil servants' decision to opt for a digital or conventional approach in PP. However, good or bad experiences regarding the number of people participating online do not seem to influence the decision of public planners to use DPPT in future participation projects. Generally, the consideration of the context and the target group of PP are considered vital to ensure comprehensive DPP.

4.4 THE EFFECT OF TRAINING ON CIVIL SERVANTS' DECISION TO ADOPT DPPT

This section provides answers to RQ 4. Henceforth, the results of the effect of DPPT training on civil servants' decision to opt for a digital or conventional approach in PP are presented (See Table 8). Training encompasses all courses and skill-advancing training concerning the deployment of the DIPAS tool. Training on DPPT is primarily offered to public planners by the MDH as part of Hamburg's IT learning infrastructure. This study's results specifically concern training civil servants did with the DIPAS tool. 40 per cent of respondents have received training with the DIPAS tool. In addition, 20 per cent of respondents attended courses on the tool. In comparison, the other 20 per cent of interviewees received individual training right before the deployment of a DPP project in the form of a personal DIPAS guidance meeting with a representative of the STW on the proper tool use.

> *'We proactively approached the Urban Workshop, which is also part of the BSW. And then we talked to the colleague who runs the workshop there, I think twice bilaterally, and then had some kind of short briefing. So not a classic training concept.'*
>
> (Interview 3, p. 6, l. 26ff.)

Another 20 per cent of respondents declared that they did not need further training because of extensive prior practice with the DIPAS tool (Interview 4). In contrast, one respondent did not get any notice of DIPAS training offers. Besides having or not having received training, the respondents differ in their perceptions of the usefulness of training. Thus, they differ in judgements of whether and in what context to use DPPT. Two categories of attitudes are distinguishable between respondents. First, interviewees with practical DPPT experience stated training was either unnecessary or did not affect their choice of adopting a DPP approach in PP (Interviews 3 & 4). The decision to opt for a DPP approach was made before the actual offer of training by the STW.

> *This 'already-having-done-two-or-three-projects' was entirely sufficient for my know-how level. So, I was not interested in doing another training course. But it is great that the training exists. Because many other colleagues still want to be won over for it' (M4)*
>
> (Interview 4, p. 16, l. 40ff.)

Second, respondents that did receive training declared to be interested in trying out DIPAS in practice, although not having found it applicable in their projects so far. At the same time, the respondents express scepticism towards the usefulness of DPPT in complex and conflicting PP projects.

Hence, the question of how training influences the decision of civil servants to opt for a digital or conventional approach is answered in two arguments. First, training is viewed by DIPAS practitioners as necessary for the further promotion of the tool and making it known. Nonetheless, training shows minor importance to civil servants' decision-making to opt for DPPT. However, training offers and civil servants attending training lead to enhanced visibility of the opportunities of DPP in participatory planning practice.

Table 8

Factors related to civil servants' attitudes towards digital tool use in participatory planning along with related qualifiers

Criteria	Sub-criteria	Qualifier
Experience	Self-efficacy	'However, we also approach the digital events relatively traditionally from the logic of the public events. That means we have an introductory lecture on the project. But this is a classic PowerPoint presentation. It is not interactive.' (M2[1], M5)
		'This already-having-done-two-or-three-projects was completely sufficient for my know-how level.' (M4)
	No experience	Personally, I have not yet conducted any events with DIPAS (M3).
Training	No Training	'That may sound sad, but I would have to actually inform myself first about who offers training with the DIPAS software and how it works.' (M2)
	Training, no experience	'I know the DIPAS tool from training courses, but I have not used it myself yet. (M5)
	No training but experience	'They started with training courses when I had already done two procedures myself.' (M4)
		'This 'already-having-done-two-or-three-projects' was entirely sufficient for my know-how level. So, I was not interested in doing another training course. (M4)
Usability	Costs	'That was technically challenging.' (M2)

[1] 'M2' refer to the respondent ID.

	Benefits	‘our goal is to engage in dialogue with as many people as we can. And to collect as many opinions and ideas as possible, the digital version is simply very well suited.‘ (All)
Trust	Trust in PP	‘I think citizen participation itself is good and very important". Because we do not do the planning for ourselves or in some abstract way, but we have a mandate, a political mandate that we fulfil as an administration.‘ (M2)
	Scepticism towards DPPT	‘We were a bit sceptical towards digital participation because in analogue events you interact with each other and see people’s immediate response.’ (M2, M5, M3) ‘The expectations were always higher than the number of real contributions that came in.‘ (M4, M3, M2) ‘At the end of the day, you need formats that are appropriate to the target group for meaningful participation. And in our experience, the online approach works for many. Not for everyone. Then you also need alternatives for this accordingly.’ (M3)

5. DISCUSSION

This section discusses the results of the analysis. The findings for each research question were analysed and presented using the respective criteria and sub-criteria (See Table 8). The main research question of this thesis was how civil servants’ attitudes influence the adoption of DPPT in local district participatory planning in Hamburg. First, this section discusses the relevance of the findings and their relation to the literature review criteria by criteria. Next, this part discusses additional findings and, finally, points towards recommendations for what topics future research should explore.

5.1 DISCUSSION OF FINDINGS

Experience

Literature suggests that prior experience with technology influences the intention of user behaviour to adopt a particular system (Venkatesh, 2000). In the context of civil servants' behavioural intention to adopt digital tools in participatory planning, prior experience and

confidence with technology influence whether civil servants decide to use DPPT in practice. Other researchers suggest that the older participants, the more sceptical or deterred are they by the difficulty of adopting DPPT (Bouzguenda et al. 2021). However, findings indicate that general experience with DPP and curiosity towards technology are defining factors for predicting DPPT adoption by civil servants in Hamburg districts. Surprisingly, results show that the consideration to adopt DPPT in participation projects does not depend on the results of prior DPP outcomes. Instead, the experience with the digital format leads to civil servants' perceived ease of using a system.

Training

The literature suggests that training in DPPT is a necessary factor in influencing the behavioural intention of users (Nochta et al., 2020). Through knowledge acquirement and training, initial scepticism and concerns toward technologies can be addressed or even changed (Zaman et al., 2021). Findings of this study indicate that training leads to interest and superficial knowledge of DPPT but does not suffice for it to be implemented by civil servants in PP practice. Surprisingly, training does not mitigate scepticism towards the complexity of technology either.

Useability

The literature suggests that the perceived usability of technology influences users' behavioural intention to adopt a new tool (Venkatesh & Davis, 1996). In the context of DPPT adoption by civil servants, perceived costs and benefits influence their behavioural intention to adopt. In Hamburg, the choice to include DPPT in the PP process is subject to the discretion of the public planner. Hence, civil servants' judgment of digital tools matters since they substantially influence the form of PP. Slotterback (2011) suggest that when confronted with highly technical tools, civil servants opt for tools or forms of participation that they evaluate as easier to use. Findings in this study support the argument made by Slotterback (2011) that planners perceive DPPT as technically challenging for themselves and people participating in their districts.

Further, the results of this study support the findings of Conroy and Evans-Cowley (2004) and Kingston et al. (2000). They suggest that a thorough use of technology in PP can be successful as an additional tool to traditional participation approaches. The results of this study show that civil servants with extensive experience with DPPT see digital tools as an asset for every PP process even though they express understanding of their colleagues' concerns addressing high personnel and financial costs of DPP processes. Further, results show the concordant belief of civil servants that there is no way for digital tools to replace analogue PP formats such

as face-to-face events completely. Henceforth, the results of this study show that civil servants regard DPPT pre-eminently as an addition to the conventional participation formats.

Trust

The literature suggests that using DPPT in participation processes is a matter of civil servants' assessment of local citizens' digital capacities (Curry, 2012; Slotterback, 2011). However, this thesis findings show no clear distinction of whether and how the scepsis towards the use of especially GIS-based DPPT like DIPAS is rooted in civil servants' mistrust towards citizens' ability to make valuable contributions to the PP decision-making process. Instead, the variable identified to detain civil servants from adopting DPPT is a context misfit of PP process. Slotterback (2011) and Afzalan and Muller (2018) suggest that considering the characteristics of the community and the target group can better inform decisions about using technology in ongoing participation projects. The results of this study show that civil servants are highly sensitive to the importance of considering the context and target group of participants.

Furthermore, research considering the aspect of trust in PP suggests that tensions emerging from differing views of citizens and planners of the means and ends to achieve participatory decision-making processes cannot be sufficiently tackled by DPP (Curry, 2012). On the other hand, the findings of this study suggest that digital tools can potentially help navigate trust issues in complex PP. Nevertheless, the results of this study suggest that for most civil servants, the means (trying to integrate DPP into the PP landscape of district offices) do not justify the ends (here, digital tools), suggesting a kind of civic-mindedness typical for civil servants. Thus, the results of this study support previous literature findings on public servants' distinctiveness in work motivation (Boyne, 2002; Rainey, 2005). Therefore, there might be different reasons behind the decision not to deploy DPP related to civil servants' general scepsis towards informal participation rather than solely their attitudes towards technology.

5.2 ADDITIONAL FINDINGS

Besides the themes and criteria identified in the literature review, two additional findings were made. First, the results show that factors related to the organisation of PP in local district departments are relevant to the adoption of DPPT (Interview 4). Some districts have employed technical and knowledgeable personnel to deploy DPP processes. These districts plan participation from the perspective that not every public planner must be an expert in DPP and digital tools. Instead, these districts view DPP as a team play between local planners' and experts' knowledge. When adopting a new software like the DIPAS tool in PP processes, different ways of organising expert knowledge seem to influence the perceived ease of use of DPPT. Hence, the organisation of supporting staff and facilities in the form of training are found

to lead to enhanced perceived ease of use by civil servants and better external evaluation of the DPP by citizens.

Second, the diffusion of the DIPAS tool seems to depend significantly on mouth-to-mouth recommendations among civil servants in local districts. The more the word on positive experiences with a tool spread, the more likely other public planners will experiment with the tool. The IT infrastructure of the City of Hamburg provides free training with the DIPAS tool. However, the variety and scattering of DPPT offered by external service providers make adopting new participation tools like DIPAS a process.

5.3 LIMITATIONS OF THE RESEARCH

Studying particular themes and criteria related to the attitudes of civil servants in the city of Hamburg's planning district department limits this research's findings. The study of civil servants' attitudes toward technology results in limitations regarding the subjectiveness of answers and interpretations of categories. For example, most respondents did not clearly understand the meaning of artificial intelligence. Thus, the interpretations of the results on the technology affinity of civil servants need to be considered with caution since they only say so much about respondents' confidence with particular technologies.

Studying the attitudes of civil servants using the TAM, it must be noted that the model has been applied extensively in the private sector. Thus, the model does not account for differences between private and public sector employees' attitudes. Furthermore, the study of civil servants' attitudes towards technology was limited to four factors. However, several other criteria, such as organisational and environmental factors, might influence civil servants' behavioural intention to adopt a new system.

Finally, this study presents only a snapshot of civil servants' attitudes. It would be viable for the research question to observe the attitudes and behaviour of civil servants over a more extended period to predict better their intention to use DPPT. Findings are thus only, to a small extent, generalisable. However, the results of this study underline the importance of considering civil servants' attitudes towards technology, especially towards DPPT, in the context of introducing and diffusing new technology in public administrations.

5.4 SUGGESTIONS FOR FUTURE RESEARCH

This study focused on civil servants' attitudes influencing the adoption of digital tools in PP without considering the institutional or organisational structures of departments. Future research should further explore the steering capacity of public managers influencing the overall adoption of DPPT in their respective district planning departments. This study's results suggest

that the experience and self-efficacy of civil servants using digital tools are essential factors for the decision to opt for a DPP approach. Future research should explore other factors influencing planners' attitudes and behavioural intention to adopt DPPT. For example, the organisational culture and institutional structure of local planning districts. Further, the results suggest that the question of the quality of participation, hence, what level of participation is desirable as in Arnstein's (1969) ladder of participation, is viable for the form and quality of citizen participation. Public administration research on civil servant behaviour in DPP should examine technology-related motivational criteria of public servants concerning the desired level of participation more closely to ensure that DPP is not only a means to an end.

6. CONCLUSION

This thesis research can contribute to the often-overlooked research pillar of public administrators' behaviour in studying government innovation technology adoption in participatory planning in the context of local district departments. An answer to the main research question of how civil servants' attitudes influence the adoption of DPPT in local district participatory planning was presented in this thesis. It is concluded that civil servants' prior experiences, self-efficacy, the perceived usability of DPPT and trust in citizens' ability to use digital tools affect their decision on whether to adopt DPPT in PP processes. The results show differences between attitudes of civil servants towards technology with DIPAS experience and civil servants without DIPAS experience. Civil servants conducting DPP with the tool DIPAS perceive DPPT as adding extra value to every PP, while public planners without DIPAS experience show more scepticism towards using DPPT. However, the findings also revealed mixed attitudes of planners towards the form and context of DPPT adoption. This suggests that the further promotion, training, and provision of hands-on practical experience with DPPT like DIPAS is necessary for adopting digital tools in cities' local planning departments. In the context of Hamburg, this research shows that besides training with digital tools, planners' own initiative or intrinsic motivation towards using technology are the main factors contributing to their decision to opt for the accompanying use of DPPT in a participation process.

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APPENDIX A

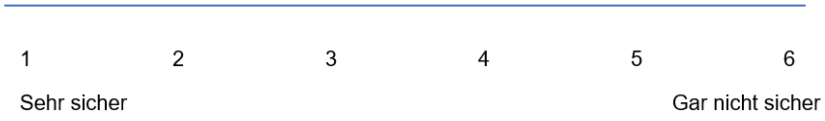
Interview Guide

1. General Questions

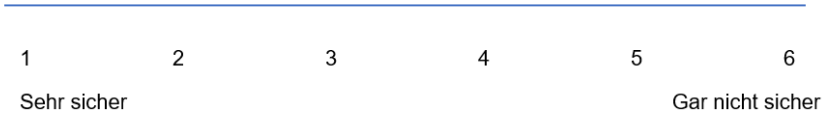
- Introduction: Who are you? How old are you?
- What is your current job title? What are your tasks and responsibilities?
- How many years of experience do you have with DPP?
- What is your working relationship with DPP?
- Have you already carried out DPP?
- How many/ where/ which ones?
- How familiar are you with DPP? Have you participated in the Digital Participation System (DIPAS) training/courses/workshops?
- Do you think that all participation processes should take place online? If yes, why / If no, why not?

On a scale of 1 to 6:

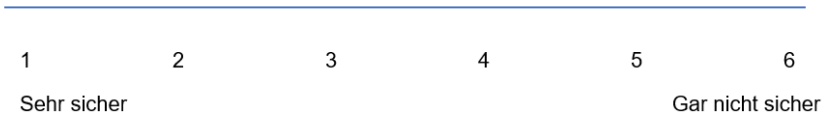
How confident do you feel in using social media?



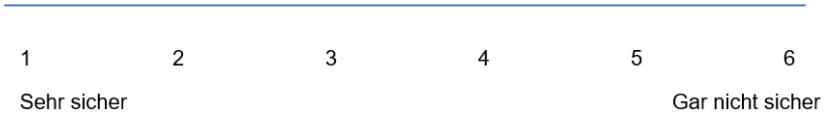
How familiar are you with the term Big Data (BD)?



How familiar are you with the term Artificial Intelligence (AI)?



How confident do you feel using digital participation tools (e.g., DIPlan, DIPAS, COSI, Urban Data Hub)?



2.Main part

- Are you currently planning a DPP?
    - Why did you specifically choose DIPAS as a participation tool? What other forms of participation were considered?
- What are your experiences in the DPP project Willhelmsburg 100/ Nördliches Elbinselquartier?
- In your opinion, what are the advantages and/ or disadvantages of digital participation formats (compared to analogue formats)?
- Do you have concepts/strategies to counter these barriers?
- In your opinion, what are the driving/restricting factors for the implementation of digital participation procedures in your district?
- Where do you see challenges in the use of DIPAS in district participatory planning?
- Have you encountered resistance to DPP from citizens?
    - Would you recommend DIPAS as a digital participation tool to colleagues? If yes, why / If no, why not?

3. Concluding Questions

- Do you think that citizens should be involved in digital forms in urban planning processes? If yes, why / If no, why not?
- What policy measures do you think would be necessary to advance the concurrent use of digital tools in participatory planning?

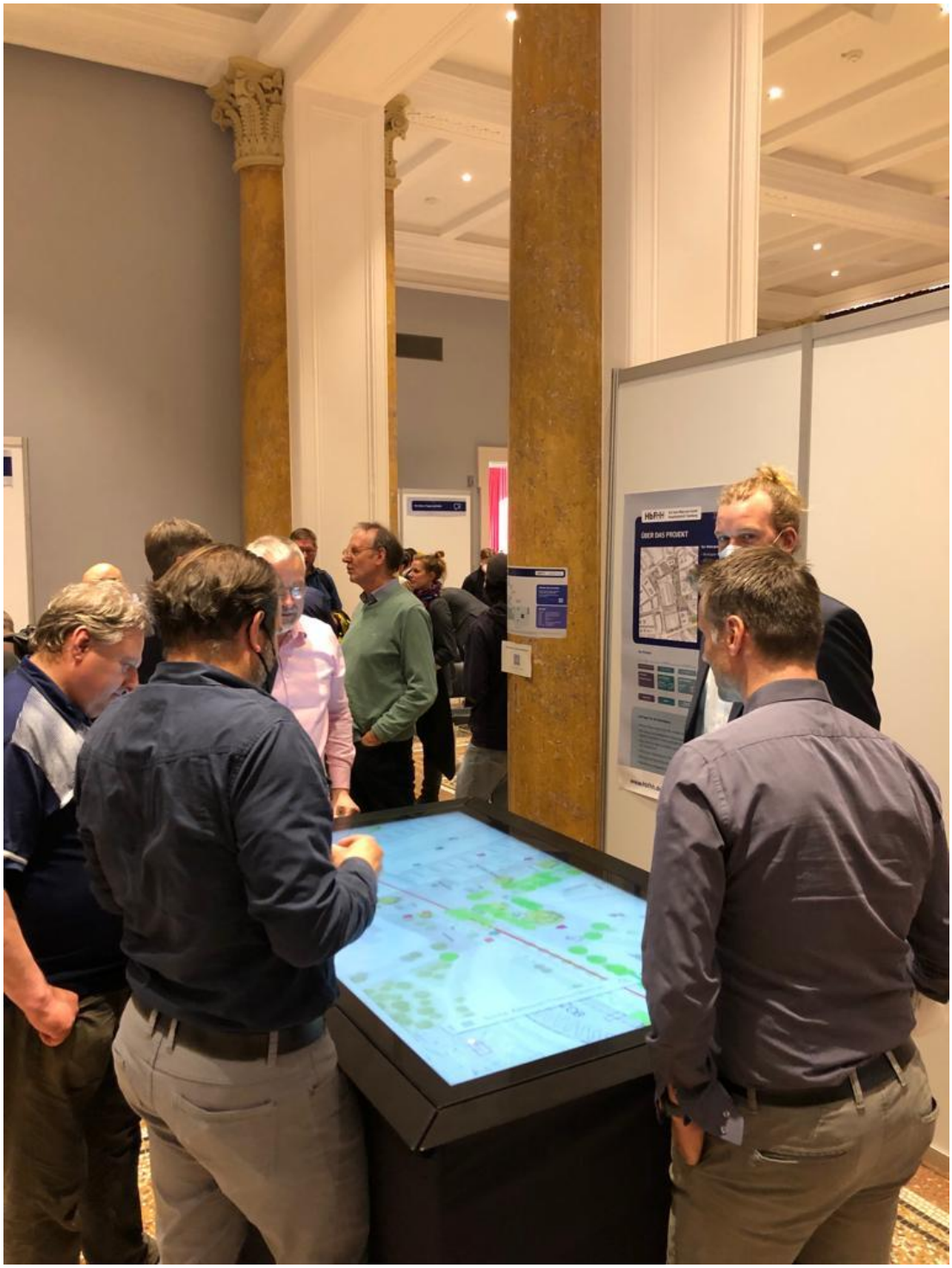
APPENDIX B

Overview of the Conducted Interviews

Interview	Respondent (ID)	Date	Time	Length (min.)
Interview 1	M1	17.5.2022	11.00 a.m.	65:40
Interview 2	M2	20.5.2022	1.00 p.m.	46:11
Interview 3	M3	23.5.2022	10:15 a.m.	25:43
Interview 4	M4	30.5.2022	3.00 p.m.	39:01
Interview 5	M5	13.6.2022	11.30 a.m.	32:20

APPENDIX C

Source: own image, Hamburg, 12.10.2022



Source: own image, Hamburg, 12.10.2022

Source: [online] Wiki DIPAS [Access, 26.6.2022]