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# The citizens have participated – what now? An action research study of factors impacting the use of participatory citizen knowledge in planning processes

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## ABSTRACT

Citizen participation is embedded into planning practice and policy, yet it remains unclear how the results of participation are shared in planning organisations and utilised to inform planning outcomes. This article examines barriers and enablers for systematic gathering, sharing and utilisation of participatory citizen knowledge and analyses the collaborative development of knowledge-sharing practices in two Finnish municipalities. The article focuses specifically on the collection and dissemination of local, experiential knowledge from two municipality-wide Public Participation GIS surveys. The study adopts an action research approach to deepen the understanding of planners' complex relationships with participatory citizen knowledge: how they gather and share it, how it informs their work and how they develop their everyday practice. The results suggest that a variety of practical, technical and cultural factors influence whether planners access and utilise gathered citizen knowledge. Planners' backgrounds, skills and personalities also influence how they perceive and utilise citizen knowledge. When provided with accessible and representative data about citizens' behaviours and preferences, adequate resources and a sense of agency through supportive organisation culture, officials from different sectors were eager to develop the use of participatory knowledge. These emergent practices can be used to inform wider iterative development to meet practitioners' needs.

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Urban planning; PPGIS; public participation; collaborative planning; participatory knowledge; action research

## 1. Introduction

Participatory planning practices have been developed and studied widely to gather local, experiential knowledge and feedback for planning, to foster collaboration between experts and citizens, and to cultivate consensus and legitimacy for planning decisions (e.g. Bäcklund and Mäntysalo 2010; Calderon and Butler 2020; Cheyne 2015; Forester 1999; Healey 1998). However, the systematic integration of citizen knowledge gathered

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through participation into planning practice and municipal governance networks remains rare (Eriksson, Fredriksson, and Syssner 2022). The purpose of this article is to identify barriers for the impactful integration and utilization of participatory knowledge in planning, and to propose ways of overcoming them through systematic, collaborative knowledge-sharing practices developed through an action research process with planners in the Finnish municipalities of Espoo and Ii.

The understanding of knowledge in planning has shifted over time between an emphasis of rational, quantifiable, technical expert knowledge and more participatory, context-sensitive, locally and fluidly defined notions of what constitutes as knowledge in each setting (Krizek, Forysth, and Slotterback 2009). Davoudi (2015) describes knowing in planning as distributed and cooperative; ‘a socially constructed understanding that emerges from practical collaboration’. Alexander (2016) suggests that effective land-use planning requires vast systematic participatory knowledge, and that planners’ key expertise is the ability co-produce knowledge with a variety of stakeholders affected by the outcomes.

In this article, we study the use of participatory knowledge, by which we mean information provided by citizens regarding their behaviours or opinions. As an example of participatory knowledge, we focus mainly on local and place-based experiential knowledge collected from citizens for planning using Public Participation GIS (PPGIS) methods (Brown and Kyttä 2018). Borén and Schmitt (2022) find that planners are challenged to effectively mobilize appropriate local knowledge from the public, and then to integrate it to practice as a basis for continuous learning within the planning organization. Continuous learning supports the proactive use of citizen knowledge from the start of a planning process, rather than reactive use in later stages. Local and place-based knowledge can be difficult to codify and transfer between actors so that it could be utilized as a basis for planning or decision-making (Borén and Schmitt 2022; Davoudi 2015; Rydin 2007). However, the adoption of PPGIS in municipalities has provided opportunities for gathering and transferring local, context-sensitive and experiential knowledge on a larger scale (Brown and Kyttä 2018), which is why we use it as an example of a type of participatory knowledge which can be distributed in a planning organization systematically. In two different contexts, we illustrate how it can be connected to other types of more context-specific participatory knowledge in practice.

The need for empirical research on the effectiveness of PPGIS has been recognized (Brown and Kyttä 2014; Jankowski et al. 2022), and the few existing case-studies on the impacts of PPGIS on planning outcomes present varying results (Jankowski et al. 2022; Kahila-Tani, Kyttä, and Geertman 2019; Kantola, Fagerholm, and Nikula 2023). A systematic review by Denwood, Huck, and Lindley (2022) showed that only 5% of the studied participatory mapping articles stated a goal of influencing policy, and of those, none discussed whether the goal was reached. Kahila-Tani, Kyttä, and Geertman (2019) state that at best, citizen knowledge collected with PPGIS would be recognized as an equal to other resources supporting planning processes – as was the goal in Espoo. While PPGIS methods have the potential to widen access for citizens to participate free of temporal or physical constraints, they are not intended to replace but to supplement traditional forms of participation, as deepening local knowledge in face-to-face meetings can be crucial for citizens’ perspectives to come across in planning (Kantola, Fagerholm, and Nikula 2023).

A scoping review by Ramirez Aranda, De Waegemaeker, and Van de Weghe (2023) categorized barriers for widespread adoption of PPGIS. The institutional barriers they found were divided into the subcategories of communication, culture, politics, regulations and resources. Previous research (see, e.g. Kahila-Tani, Kytta, and Geertman 2019); Jankowski et al. (2022); Bąkowska-Waldmann (2023); Kantola, Fagerholm, and Nikula (2023) has focused on planners' experiences of PPGIS methods in processes without researcher involvement, while in this study, an active, action research approach for developing the effectiveness of knowledge sharing and utilization was adopted. This allowed closer scrutiny of the development of knowledge integration in the municipalities.

The study focused on the collection and integration of city-wide PPGIS data sets in two Finnish municipalities, Espoo and Ii. In Espoo, the goal of the data collection was to produce local, experiential citizen knowledge to serve as a background knowledge layer alongside institutional GIS data in all future strategic and detailed planning processes. In Ii, the data were collected primarily to inform an ongoing strategic master plan process.

This research process sought to increase the accessibility and familiarity of PPGIS knowledge in two planning organizations, and to understand whether this would translate to increased usability of the data for planners. Through an action research process, we analysed the development of systematic ways to integrate participatory knowledge into planning practice throughout a public organization – what conditions need to be met for successful integration, and what can be learned from these developments in other municipalities?

### **1.1. Barriers to effective utilization of participatory citizen knowledge**

Practical barriers to effective and inclusive participation and subsequent knowledge integration remain prevalent (Kantola, Fagerholm, and Nikula 2023; Ramirez Aranda, De Waegemaeker, and Van de Weghe 2023; Staffans et al. 2020). Participation processes have been widely discussed and developed, whereas the systematic, context-sensitive utilization of the knowledge gained through participation is rarely achieved in practice (Eriksson, Fredriksson, and Syssner 2022). Planners report that while they are aware an abundance of data about citizen preferences exists, it is not accessible or there is a lack of skills or resources to properly utilize available information within planning processes (Ramirez Aranda, De Waegemaeker, and Van de Weghe 2023). Sometimes, these barriers can also have a positive impact on participation – Yang and Callahan (2007) suggest that the lack of resources in a public organization might also encourage planners to build stakeholder networks, and independently develop practices to engage them to meet their knowledge needs.

If participatory knowledge is not collected, analysed and disseminated systematically within a planning organization, access to the gathered knowledge remains limited to the individuals involved in the specific process. Such knowledge can only be utilized in small sequences with no feedback loops to other planning processes, making it ineffective for planners, citizens and other stakeholders (Staffans et al. 2020). Sharing participatory knowledge within organizations is particularly challenging due to the overlapping planning and decision-making processes of varied scales which would utilize the knowledge

over extended periods of time with a variety of internal and external stakeholders. PPGIS knowledge can be stored and managed in geographic information systems to allow simultaneous, accessible use in different processes (Jankowski et al. 2022), independent of the actors involved. However, most planning organizations do not provide planners with access to city-wide databases of citizens' experiential knowledge to support planning in the initiation stage (Staffans et al. 2020).

Researchers and experts have suggested early-stage participation as one solution to the lack of influence participation has on planning outcomes (Kahila-Tani, Kytta, and Geertman 2019). According to Reed et al. (2018), early participation yields the most diverse citizen knowledge: in later stages potential ideas and influence can be limited by already prepared plans and set goals. Later stages of participation can be used to deepen, prioritize and validate the gathered citizen knowledge and planning proposals, described by Staffans et al. (2020) as diverging and converging phases of participation.

Planners' individual attitudes towards participation influence their practice and their motivation for development (Puustinen 2006). Othengrafen and Levin-Keitel (2019) found that while planners' individual characteristics affect their approach to development of practice, the formalization of planning has emphasized technical aspects of creating binding land-use plans. This reduces the capacity and prerogative for planners to engage in innovative development while balancing between structural tensions related to their role in a political organization. Healey (2009) argues that if a shared effort is made to avoid slipping into limiting routines, purposeful, collaborative improvements can be made to planning practice and consequently the impacts of real-world planning outcomes, and the wealth of scientific and experiential knowledge available can help define and evaluate these projects meaningfully. Niitamo (2021) calls for planners to reflect on their roles as democratic actors and engage in value-based discussions on how to develop citizen engagement accordingly.

Zakhour (2020) points out that legitimacy is too often falsely understood as an inherent result of a participatory process. Technical advancements or accessibility of participation do not increase legitimacy if participants feel the process has no influence on planning outcomes (Huang et al. 2021; Ruming 2019). When using online participation methods such as PPGIS, planners must also remain cognizant of groups that may be excluded (or exclude themselves). Brown and Kytta (2018) suggest that sampling design is a critical consideration in PPGIS data gathering, as self-selection among participants may lead to bias in the represented perspectives, and obscure and reinforce existing power relationships.

Puustinen (2006) shows that the elusive common good or the citizens' best interest is a key concern for planners, but if citizens have no way of knowing how their inputs affect planning, it is hard to trust that their concerns and opinions are being considered. Stakeholders' disappointment in the impacts of participatory processes can escalate conflicts and mistrust (Reed et al. 2018), which has been found to be a key reason for non-participation of some citizen groups (Yang and Callahan 2007). Thus, we argue that more research regarding the integration and impact of participatory knowledge is required, as empirical studies of knowledge integration in planning remain rare (Stepanova and Saldert 2022).

## 1.2. Planning organizations, public participation and PPGIS in Finland

The Finnish land use planning system is juridical and hierarchical, and municipalities have a zoning monopoly (Purkarthofer and Mattila 2023). The Finnish planning approach has been categorized as comprehensive integrated alongside other Nordic countries, Baltics, and several central and eastern European countries (Nadin and Stead 2008). Land use planning practice and building legislation in Finland have formalized and integrated collaborative planning methods in planning processes (Puustinen 2006): the land use planning act guarantees each citizen the right to participate in planning processes that significantly affect them (Finlex 132/1999, 6 §). However, the law does not indicate what type of influence the participation should have on planning outcomes.

Varied methods for engaging citizens and disseminating resulting knowledge are used by public governing bodies. Nevertheless, Finnish municipalities have also been challenged for providing inadequate resource for planners to develop participatory processes (Niitamo 2021), and recent attempts to streamline planning processes due to economic concerns have been seen to limit the influence of participation (Leino 2024).

PPGIS tools have been adopted in many Finnish municipalities in recent years to gather large-scale, place-based, experiential knowledge from citizens (Kahila-Tani et al. 2016). PPGIS is intended to expand the outreach to potential participants, unconstrained to a specific location or time, and to collect contextualized data containing information of behaviours and values relevant to planning (Sieber 2006). However, results have generally not been collected systematically or reported in scientific studies, and their utilization has typically remained contained to specific planning processes (Kantola 2021).

## 1.3. Context of the study

The action research processes described in this article took place in the municipalities of Espoo and Ii. Espoo is the second largest city in Finland with 305,274 residents at the end of 2022 (Statistics Finland, 2024), located in the capital region in Southern Finland. Ii is a municipality of 9853 residents in 2022 (Statistics Finland, 2024) located north of the regional centre Oulu in Northern Finland.

In Espoo, collaboration was initiated after the identification of the need for a city-wide citizen data set for use in planning. Three PPGIS surveys under the title 'My Espoo on the Map' with complementary participant recruitment strategies were designed and conducted in 2020. In the surveys, the participants were asked to map home locations, everyday places, and places of special meaning, ideas for development, important city centers and potential locations for new housing. Additionally, participants were asked to provide information about their perceived health and well-being and their previous experiences of public participation. Altogether 6605 citizens of Espoo participated in the survey's three implementations: a random sample survey ( $n = 2066$ ), an open survey ( $n = 2132$ ) and a youth survey conducted in secondary schools ( $n = 2407$ ). Overall, participants mapped nearly 70,000 locations.

In Ii, collaboration was initiated to support the participation of a strategic master plan. A PPGIS survey covering the same general themes as the Espoo survey with some localized questions related to the development of green, waterfront and recreational areas was conducted in 2021. A member from each household in Ii was invited to participate via letter. Three hundred and ninety-nine citizens participated, mapping 3874 locations.

In Espoo, the plan was to integrate survey results into the municipal planning support system (PSS), which planners use for their everyday work to acquire background information for projects. Before integration, the data were distributed to interested planners, which provided early insights into their use of PPGIS knowledge.

## 2. Methods

This study adopted an action research approach to develop the usability and integration of PPGIS knowledge in two planning organizations. To complement the context-sensitive action research process and to inform proposed developments, we also carried out a series of workshops, surveys and interviews with practitioners. More formal data gathering methods with a broader outreach were used in the larger organization of Espoo, while in Ii, the insights arose from collaborative work with the planner of the municipality.

### 2.1. Action research

We conducted the study using an action research (AR) approach. Action research is defined as a pursuit to create ‘transformative change through the simultaneous process of taking action and doing research, which are linked together by critical reflection’ (Rowell et al. 2015). Moreover, action research is participatory and democratic, and for the results to be relevant, problem identification and goal setting must be collaborative, and the knowledge of the process being developed must come from within the organization the research process seeks to transform either iteratively or more fundamentally (Reason and Bradbury 2001). AR can cover various perspectives on (inter)personal practice and inquiry. Distinguishing between subjective, inter-subjective and objective voices and acknowledging temporal dimensions is necessary (Chandler and Torbert 2003).

AR consists of phases related to identification and analysis of the problem, planning and implementation of the action, and monitoring and reflection of the outcomes, revisited in multiple cycles with iterative changes as capabilities and understanding grow (Reason and Bradbury 2001). In Nordic countries, AR has been utilized over several decades to strive for increased autonomy in working organizations, turning also to development of participatory democracy in public organizations (Gustavsen, Hansson, and Qvale 2008).

Our research was initiated when practitioners in Espoo encountered the need to gather a city-wide experiential data set to provide background information for their upcoming master planning process and approached the researchers for collaboration. The knowledge needs related to practice and research (including this study and various others which draw from the collected PPGIS data) were defined collaboratively by a team of planning practitioners and managers at the two studied municipalities, and the researchers.

In Espoo, the research initially focused around developing and implementing the PPGIS survey. For two years following the survey, the research was conducted via different forms of collaboration for process development and data gathering. The ambitious goal of this AR process was to develop planning practice in Espoo so that the gathered PPGIS data set could be and would be used as background knowledge layer throughout all future strategic and detailed planning projects.



The research process was structured around monthly working meetings, separate thematic collaboration and the planner workshops described in the following section. We also identified and collaborated with experts outside the project team in relation to the PSS and the early adoption of the data into planning practice.

In Ii, the goal of the AR process was to carry out the municipality's first PPGIS survey, to integrate its results into their strategic master planning process, and to identify and develop practices for other potential use cases for the data set. The research was structured around the survey planning and dissemination, carried out mostly through remote meetings between the land use planner, communications expert, and the researchers involved. We also held a three-day in-situ workshop to study how the results were used in the strategic master plan process and its official participation process, and to plan how they could be integrated more widely into planning and development projects in the municipality. During the final workshop day, we collaboratively processed the survey results related to small concrete improvement suggestions so they could inform future municipal budget planning.

We have followed the steps established by Lincoln and Guba (1985) to ensure reliability in our study, and have organized collaborative, systematic reflections with practitioners involved in the study. They were invited to review and validate the results and claims in this article.

## 2.2. Planner workshops

With the project team in Espoo, we co-organized three one-hour workshops with planners and other experts following the completion of the survey in Spring 2021 and the integration of the data set to the municipal PSS in Spring 2022 (Table 1). The workshops had three distinct functions:

1. To disseminate knowledge of the dataset and help experts identify ways it can support their practice.
2. To test the usability of the dataset, develop ways of delivering the data, and to communicate expectations regarding its use.
3. To gather research data from the process through discussions, workshop tasks and surveys to participants.

**Table 1.** Sequence of planner workshops.

	Workshop 1	Workshop 2	Workshop 3
<b>Theme</b>	Presenting the data set, establishing planners' needs related to them	First user tests, discussing planners' needs for data use	Presenting and testing use of results on LocusCloud
<b>Participants</b>	35	36	44
<b>Participants' departments</b>	Planning (detailed, strategic, traffic and landscape)	Planning, communications	Planning, communications, library
<b>Meeting tool</b>	Teams	Teams	Teams
<b>Collaboration tool</b>	Miro board	Google Jamboard	Presemo
<b>Additional</b>		Pre-survey to participants (N = 29)	

The workshop findings, documented as interactive notes, survey responses and the researchers' discussion notes were analysed by categorizing and comparing planners' inputs on the topics that were prevalent in the discussion. The analysis was conducted collaboratively with the practitioners in the project team.

### **2.3. Expert interviews**

To supplement and validate knowledge gained through the AR process and workshops, we held 13 semi-structured interviews with planners regarding their usage of citizen knowledge in their work. The duration of each interview was 1–1.5 h; they were conducted online and recorded with the participants' consent. First, we held a test interview with the project leader in Espoo. Subsequent interviewees were recruited by snowball sampling based on recommendations from previous interviewees, and among volunteers from the workshops. A final, more loosely structured interview was conducted near the completion of the process with a new project leader at Espoo; the goal was to validate the descriptions of the activities and to reflect on the outcomes and discussion.

The interviewees held planning, leadership and participation coordination positions related to strategic and detailed planning in large Finnish municipalities. While our focus was specifically on using PPGIS data, we also invited planners to provide more general views into utilizing and sharing citizen knowledge gained through participation.

Interview themes included:

1. Gathering participatory knowledge
2. Utilizing participatory knowledge in everyday planning practice
3. Barriers and enablers are related to use of knowledge
4. Organizational and political context of using participatory knowledge

Inductive thematic analysis (Braun and Clarke 2006) was conducted with interview notes and relevant transcribed sections by coding the results in Atlas.ti, and then collaboratively visually clustering and analysing the results in different themes and code groups, following process reliability criteria described by Nowell et al. (2017).

We divided the factors impacting use of participatory knowledge into intrinsic factors planners described within their own character, perceptions and capabilities; and external factors identified individually and collectively related to the organizational values and culture, tools, resources and shared practices.

### **2.4. Study strengths and limitations**

Due to the close collaboration with practitioners stemming from the participatory action research approach, our study provides valuable insights into planners' everyday issues related to knowledge-sharing and continuous development of practices. This also means that our results are highly contextual and might not be directly applicable in different municipalities. The goals, legislation and challenges surrounding participatory planning and development of PSS including PPGIS seem to be somewhat shared at least in a European context. Previous studies on the impacts of PPGIS (e.g. Jankowski et al. 2022; Ramirez Aranda, De Waegemaeker, and Van de Weghe 2023) have found

complementary results in different European countries with relatively similar planning traditions, but we recommend further research in contexts where technical limitations or resource constraints pose challenges to participatory mapping and knowledge sharing.

While the experiences we uncovered might not represent those of all planners in similar roles in different contexts, our findings regarding the factors that affected planners' attitudes towards participatory knowledge and knowledge-sharing in these cases provided useful insights for identifying and overcoming local challenges in different contexts. Our studies looked at two municipalities of vastly different organizational scale with different planning support systems and experience in using PPGIS, which helped understand barriers in different contexts, and develop actionable ways to integrate participatory knowledge.

### 3. Results

We found detailed individual perceptions and broader shared understandings of the barriers and enablers surrounding the use of local, place-based participatory knowledge in planning, and were able to test and analyse the development of knowledge sharing practices.

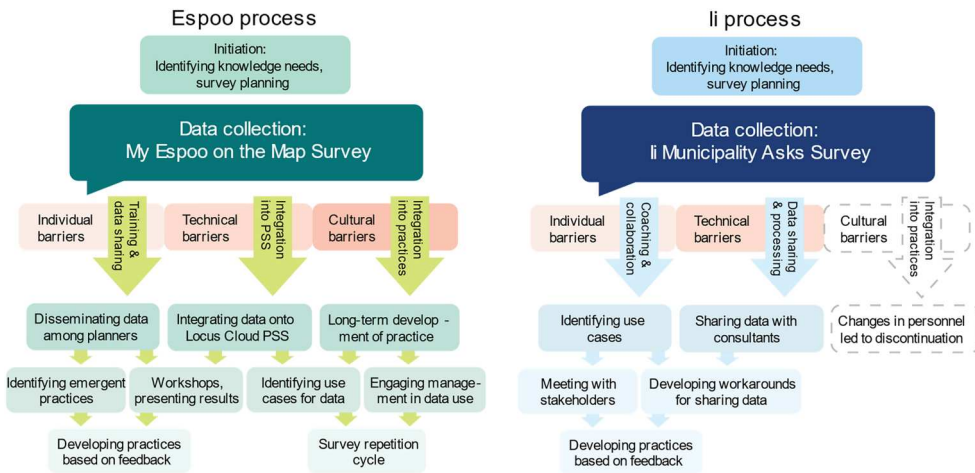
Planners reported using participants' input both directly to inform or evaluate planning decisions as well as indirectly to build tacit knowledge and contextual understanding of the area and stakeholders' roles and activities there. Some of the interviewees had worked directly with the MyEspoo on the Map PPGIS survey results, using them both to inform planning decisions and to build a basis for participation in the context of a specific planning process.

In the two municipalities, the planners' ability to independently search, analyse and transmit the data differed vastly. Espoo had their own software licence for the PPGIS tool, *Maptionnaire*, and could control survey data directly, and the goal from the beginning was to upload the data set as a layer to the PSS utilized by all planners in their everyday work. For the Ii survey, the practitioners had to rely on the researchers who collected the survey data to access it, and the results were not available on a municipal platform, which made the process more susceptible to discontinuity with personnel changes (Figure 1).

#### 3.1. External factors that influenced planners' use of participatory knowledge

##### 3.1.1. The role of participatory knowledge in planning

The planners who participated in our workshops in Espoo had used participatory knowledge and PPGIS surveys in their work both to gather specific background information for planning projects, and as a feedback channel during planning processes for giving comments on plan proposals. They found PPGIS useful for identifying areas and specific places locals valued, markers of neighbourhood identity, and factors impacting mobility patterns, particularly the walkability and perceived pleasantness of environments. While we noted a slight emphasis on using PPGIS for early-stage knowledge gathering, among the planners and managers we worked with there was a consensus that ideally place-based knowledge would be utilized in all stages of planning, from background to goal setting to evaluation of planning proposals, and if possible, also follow-up via periodically repeated PPGIS surveys.



**Figure 1.** Process descriptions from Espoo and Ii with key results.

In Ii, participatory knowledge was used for example to identify characteristics unique to each village in the municipality, to identify places for development of recreational activities and tourism, and to identify potential points of conflict in the ongoing strategic master planning process. Upon the analysis of the PPGIS survey results, we noticed that in the context of a municipality with a small population and a large geographic area, suggested developments focused even more on very tangible maintenance and spatial management issues than in Espoo, where the survey questions and seemingly the respondents' mindset was more oriented to responding to pressure to accommodate rapid population growth.

For the concrete, small scale development suggestions in the Ii survey to be usable by the municipality, strategies for using the results in alternative processes and sectors were developed. Solutions were to suggest this data set be used to identify potential projects for participatory budgeting, and to gather all the concrete development ideas from the data and to categorize them based on resource intensity and cost. This could be used by municipal and elected officials to identify targets to prioritize in budgeting: smaller projects could be carried out on a shorter timeframe as low hanging fruits to demonstrate the proactive use of citizen's inputs, while larger projects could be scheduled for later planning.

### 3.1.2. The format of participatory knowledge

Several planners in Espoo wished for access to raw data from PPGIS surveys to conduct analyses on their own with their preferred GIS programs. They acknowledged, however, that while this is a valuable source of information for those with GIS skills, it is critical that the knowledge can be accessed, viewed and processed into thematic reports within a system that does not require intensive training to use, such as map-based systems used for storing GIS data internally or publicly.

In the final workshop in Espoo, we presented the data set on the LocusCloud system, showing examples of knowledge layers and potential ways to filter mappings, and asked planners to test the data in ways they would in their everyday practice. We found that

simple things impacted the perceived clarity and ease of use of the data set: for example, symbols or colour codes for certain different mapping categories were not distinguishable enough, making the mappings hard to read. Planners also wished for additional information regarding the respondent related to each mapping, such as distance from the respondents' home location.

### **3.1.3. Knowledge sharing and accessibility**

The first challenge we identified was informing planners about what kind of participatory knowledge exists, and where it is stored. They should have access to usable, simple enough data sets to not be overwhelmed by the amount of data. The second challenge we found is to provide the data in a format which is usable for different phases of different types of planning projects, and with different skillsets. The third challenge is to offer support and foster motivation for planners to use the available knowledge, and then to provide clear guidelines and simple enough templates for them to use it systematically in each project.

In Espoo, some planners took it upon themselves to create templates for others to be able to create simple thematic visualizations of the MyEspoo survey results by just choosing their target area, and these have become the basis of development for a wider adoption of the survey results as a mandatory background material for planning. Interviewees from municipalities which did not yet display survey results on a shared map-based system hoped for the adoption of a similar practice in their organization.

A concern for leaders and planners in a coordinating role was how to transmit knowledge collected via surveys to other departments in the municipality, particularly to management of public spaces after the realization of plans, but also to different service sectors such as education or recreational services, who often lack access to or existing practices for using municipal GIS. Even within the planning sector, existing participatory data were reported to easily become buried in separate project folders, and not kept up to date. The planners hoped that the collected information would be stored in a fixed place under a fixed name.

In Ii, much of the planning work was done by consultants who had varying levels of local knowledge, while the role of the municipal land use planner was mainly to coordinate planning processes. A municipality-owned company was responsible for communications and strategic work, and despite close practical collaborations, since the organizations didn't share internal databases, we encountered significant difficulties in sharing survey results and coordinating how they are used. After the on-site workshop, where we held shared sessions to identify uses for the data, the external experts working with relevant processes seemed to have a lowered threshold to reach out when they needed to access the data or support with analyses.

### **3.1.4. Time and other resources**

The most common concern in all workshops and interviews was whether planners had time to process and utilize participatory knowledge in the extent that they wished to. Many felt that in typical detailed planning processes there would only be time, funding and support resources available for the bare minimum participation required by legislation. Resources and dedication to participatory processes were perceived to increase when there was an identified risk or history of conflict in the planning area.

However, this did not necessarily mean increased resources for processing results into a usable format, but rather focused on the placation of the public through communication efforts unless there was a significant input from the planners themselves to analyse the results.

Some planners gave examples of cases where they had advocated for and been permitted to go beyond the required participation and had developed participation processes, for example using PPGIS survey results as a basis to organize collaborative workshops for citizens. Planners brought up cases where they had dedicated momentous effort into data gathering and analyses. While they felt that they needed to simplify planning problems to make them understandable for the public, in the cases where they were able to do this with thorough consideration, they were positively surprised by the abundance of usable knowledge that resulted. One planner even felt that the lack of external support such as that of GIS experts allowed them to explore the knowledge more freely and utilize it in a way that felt natural to them.

The availability of resources for participation differed significantly in each municipality according to experts with experience of working in different organizations. Some planners in Espoo were concerned about the additional workload using a new data source would bring and asked for clear guidelines about how the data are expected to be used in planning processes. We did not encounter any criticism towards the use of this information potentially becoming mandatory, however.

In some cases, planners felt that resources for organizing participation had dwindled from their peak years in the early 2000s when participation was introduced to Finnish legislation. In one city, dedicated participation experts with knowledge of area-specific issues previously worked in each planning team, creating a low threshold to collaborate directly with planners. Since the experts were moved to a separate communication sector, planners felt that access to their support was clearly reduced, and that the emphasis of participation shifted to communication of plans rather than collection of knowledge or collaboration on planning proposals.

In general, organizational silos were perceived to increase each sectors' protectiveness towards their own time and resources, leading to sub-optimization of goals and priorities and reduced collaboration among sectors even when it would be practical and mutually beneficial.

### **3.1.5. Organization culture**

Perceptions of the impacts of the organizational culture on one's professional activities and one's presence and communication to citizens in participatory processes varied even within the same planning organization and team, depending on the planners' personal attitudes and experiences.

Several interviewees pointed out that there was a disparity between the rhetoric and strategic emphasis of participation and resources dedicated to it in everyday practice. Managers who worked cross-sectorally were skeptical of whether the proclaimed emphasis on citizen participation was truly embedded in the most important or practical decisions, such as budget planning. The situation within the planning sector was perceived more optimistically, and in Espoo, many planners perceived the culture as supportive for not only using but also developing the use of participatory knowledge. This

finding is supported by the observed emergent practices related to the MyEspoo results developed by individual planners.

The planners who perceived the organizational culture as supportive specifically identified champions who had developed the culture around participation and use of citizen knowledge, some of whom were also prominent in the development and dissemination activities of the MyEspoo survey. This finding supports the prior claims (Brown and Kyttä 2018; Ramirez Aranda, De Waegemaeker, and Van de Weghe 2023) that the role of individual champions is significant in how the culture of the organization is perceived, which then impacted the planners' attitude toward using citizen data and developing participatory processes.

### ***3.2. Intrinsic factors that influenced planners' use of participatory knowledge***

#### ***3.2.1. Planners' skills and capabilities***

The level of GIS skills altered greatly the planners' perception of their ability to utilize place-based citizen data. It seemed that those who possessed GIS skills personally were more likely to ask the organizations' GIS experts to conduct specific analyses they needed for their work, if they did not have time to analyse the survey results themselves. This might be a result of them being familiar with the potential uses of the data set at hand, or an ability to ask for more specific analyses which might be less time consuming for experts to provide than a general analysis would be. Two interviewed experts suggested that surveys or analyses cannot fully address the planners' knowledge needs if they do not have at least a basic understanding of the GIS methods or PPGIS tools.

It seems that GIS skills made planners more proactive in utilizing available place-based citizen data in their work. In the case of the MyEspoo survey, planners who were comfortable using GIS software and methods started utilizing the results even before they were available on the LocusCloud platform, while others were reliant on other planners or GIS experts to help them access the results.

Practitioners who worked with master planning mostly had existing GIS skills, while planners, specifically those with an education background in architecture who worked in detailed planning often did not. There was also an age group difference: younger planners were more likely to value GIS methods in their work and had learned these skills either during their education or early in their career, while older planners did not view GIS skills as fundamental to their practice. The leaders we interviewed and collaborated with saw a need for additional training whenever introducing or mainstreaming new methods and understood that accommodations needed to be made for planners to be able to use place-based knowledge without having to independently analyse data sets.

#### ***3.2.2. Planners' personalities and attitudes***

Interviewees regarded individual planners' attitudes towards participation and using participatory citizen knowledge in planning as matter depending on one's personality and felt that their attitudes were not representative of the respective cities they worked in, though they recognized that the organizational context and atmosphere impacted their ability to use citizen knowledge. A planner, who has worked in several different cities, described it as follows:

Different types of planners are naturally inclined to use [participatory knowledge] differently, and more or less intensively depending on how much they believe in their own vision of ‘the only possible plan’, or if they find a community-based approach to planning the environment more natural. In my experience, this is more personality than city-based.

Several interviewees suggested that a division into plan- and people-oriented planners is somewhat visible. Factors that they found to impact this are age group and education, as older planners have been trained and begun their careers in a time where participation was not emphasized. Where younger generations have learned extensively about participatory methods and the importance of participatory knowledge, older practitioners reported having had to take additional training regarding the subject. This finding aligns with Puustinen (2006) in suggesting that Finnish planners’ perceptions of their profession and of the role of participation differ based on when they have been educated.

Planners recognized that the lack of resources, particularly the support of external GIS or participation experts, affects practitioners with different personalities unequally – some, who had existing relationships with the people they needed to approach for help with data analysis, and were not afraid to ask, felt they received a lot more support for experts in the organization than their colleagues did.

Many of the planners cited specific projects where they were particularly excited about the data they had gathered from citizens and mentioned having put significant effort into the planning and execution of the data collection, as well as processing and utilizing the knowledge. A general motivation towards more widely utilizing place-based citizen knowledge was apparent from both the interviews and workshops, however the planners were worried about having enough support or working time to dedicate to this.

Planners felt positive about situations where they were able to utilize knowledge provided by citizens. Particularly positive emotions were related to cases where participation provided new knowledge or solutions to planning problems that the planner found improved the plan, and the inputs were mainly concrete, constructive suggestions which aligned with the boundary conditions for the planning case at hand. ‘You get comments which make you rethink something – they act as a spark to find a better solution’.

Planners were apprehensive towards feedback or suggestions that were untenable or combative. ‘When someone calls the planner an idiot, how do you take that feedback into account?’

### *3.2.3. Planners’ attitudes and wishes regarding place-based citizen data*

Planners emphasized that meaningful participatory knowledge would be place-based, relatively detailed, novel or previously unexplored, constructive and iterative rather than challenging the basic goals and premises of the process in question. A goal with using online participation methods such as PPGIS in Espoo was to reach citizens who don’t normally participate. This seemed to be successful particularly in the random sample survey, where 71% of participants had no prior experience of participating in planning.

Planners were very concerned about the representativeness of respondents in both PPGIS surveys and participation in general, and in the case of the MyEspoo survey, emphasized access to metadata regarding representativeness. According to planners, participation efforts should be targeted to underrepresented groups. Current methods cater towards highly educated, active and Finnish-speaking citizens, whereas families with



young children, youths and citizens with an immigrant background are not reached. Planners felt that by introducing more diverse methods and languages to participation, more varied views from all kinds of people could be attained. 'Participation is not targeted in any way. We strive for an equal, balanced approach. Maybe to be equal, we should utilize different methods for different citizen groups', one transport planner reflected.

Planners experienced that the use of online methods reached a more heterogeneous group of participants compared to traditional methods. They were also very keen on knowing about geographic representativeness of respondents, and in the case of PPGIS surveys, wanted to know the distance between the home of the respondent and their mappings. Planners seemed more concerned about the needs of nearby residents compared to other stakeholders in the area, though some also brought up that in planning, it would be important to also reach potential future residents, and PPGIS might be a solution for this.

Regarding representativeness in the data set, during the Espoo process we developed ways to identify the presence of underrepresented groups in an area based on the PPGIS data, and to plan for targeted ways to reach these people in later participation. One suggested practice was to carefully note when open responses mentioned other people as a source of discomfort in a public space – this might suggest the presence of people experiencing homelessness or substance abuse, issues which could be alleviated by planning initiatives which increase safety and social inclusion for vulnerable citizens.

Finally, planners throughout our workshops and interviews seemed fairly convinced that there exists a 'silent majority', who do not voice their opinions through participation but who are generally satisfied with planning in their area. The planners seemed keen to interpret negative comments as outliers rather than shared experiences, and were hoping for quantifiable, place-based experiential data to validate this assumption. They were also highly critical of mistakes in participants' inputs, such as individual mappings containing errors, and worried that these might raise questions about the integrity of the data in the political process. A majority of the interviewees recalled some negative experiences of public participation particularly in public meetings: many had been subjected to significant pressure and sometimes aggression from participants. In Ii, city officials were surprised to find that an overwhelming majority of mappings made by citizens in the survey were in fact regarding positively perceived places. Previous PPGIS studies (Kahila-Tani et al. 2016) have found that people are more likely to map places they have a positive connection to than places they perceive negatively, but for planning practitioners, participation can still yield mainly critical feedback, and to some interviewees, even highly personal verbal attacks. Several interviewees saw potential in PPGIS data to provide more balanced information about citizens' preferences and experiences. Some had utilized the results of the MyEspoo survey to provide context for later participation and hoped that referring to survey results would provide justification for planning proposals.

#### 4. Discussion

Our study focused on turning citizen data, which many municipalities increasingly collect, into shared and accessible participatory citizen knowledge. The goal was to

embed PPGIS survey results into planning practice, allowing experts to tap into these results at will, and to study and remove barriers to do so. Following Davoudi's (2015) framing of planning as the collaborative practice of knowing, research with Espoo and Ii yielded insights and advances into the sharing of knowledge within planning organizations and with external stakeholders.

Eriksson, Fredriksson, and Syssner (2022) noted that systematic, context-sensitive utilization of citizen knowledge is rarely achieved, as the effort and resources are spent in the participation process. In this study, we found that experts with different personalities, experience levels, and educational backgrounds react individually to new knowledge, methods and processes, organizational culture, and development. Because of this, systematic utilization of participatory knowledge is difficult to achieve as individual practices emerge (or persist despite recognized need for development). Though the planning system aims to integrate policies across sectors (Nadin and Stead 2008), organizational siloes continue to separate planning and participation experts in everyday practice. Even further removed are the officials responsible for management, real-estate, service provision and other sectors, which impedes knowledge sharing and increases the risk of each group sub-optimally prioritizing their own goals and resources instead of searching for shared goals and prioritizing efforts based on those, as Quitzau et al. (2022) described. Silos can also lead to gaps in understanding of contexts and boundaries different teams are working under, making it more difficult to recognize knowledge needs, plan participation, and disseminate the results accessibly and effectively.

#### **4.1. Conditions for knowledge integration in planning organizations**

Though municipalities have been criticized for stream-lining planning processes to the detriment of participation (Leino 2024) and not dedicating enough resources to their development (Niitamo 2021), we found that on an expert level, planners did perceive their own capabilities for developing the use of participatory knowledge positively especially in Espoo. Though managers were slightly less optimistic about the dedication of enough resources to match the publicly stated priority of participation, it is encouraging to find that planners who have a relative independence in their practice feel able to develop it as they deem necessary. As Healey (2009) suggests, limiting routines can be a barrier for development in planning organizations, and reflection and a sense of agency help facilitate development that can respond to the practitioners' needs.

Ramirez Aranda, De Waegemaeker, and Van de Weghe (2023) suggest that barriers to utilizing PPGIS knowledge in planning have shifted from technical and epistemological to cultural, pertaining to institutions and participants alike. We found evidence of both technical and cultural barriers to using the collected data. Their significance also changed over the course of the study. Some technical barriers, such as having to separately apply for access to the PSS if working in another sector of the municipality, while relatively simple to overcome in practice, discouraged even motivated users from accessing existing knowledge.

Staffans et al. (2020) found that planners are aware of the abundance of citizen data, but they lack access or skills and resources necessary to utilize the knowledge in practice. Our study additionally suggests that those with at least basic GIS-skills seem more likely to pursue and gain access to the support of GIS specialists to analyse PPGIS data for their

work, while those who lack these skills are less likely to utilize the data altogether. This may have to do with planners' familiarity with the potential applications of the data, or with resource constraints – it may be easier for an expert with limited time resources to provide a specific analysis upon request, than to start exploring the data for an answer to a broader question.

The role of external support from research collaboration can make up for the lack of resources to bridge these gaps in practice. As Borén and Schmitt (2022) noted, academic scholars can introduce ideas that help develop planning practices and outcomes, provided the local actors feel they truly benefit from the collaboration rather than feeling it is superimposed or extra work without added value for their practice. This point of view came up often in the discussions with planners from Espoo – they were able to dedicate significant time and other resources to the development of the MyEspoo survey and the subsequent dissemination and knowledge integration process, because it was tied to their upcoming strategic master plan process, which would have taken place with or without research support. However, in part due to the structure, support and additional development resources provided by the research collaboration, they were able to engage in development to a significantly greater extent than would have otherwise been possible.

Not limited to research collaboration, the development of practice should always be adapted to needs of practitioners (Laurian and Shaw 2009), and participatory knowledge should provide answers relevant to the case at hand to be impactful (Kahila-Tani, Kytta, and Geertman 2019). This is exemplified in the case of Espoo by the adoption of emergent practices. Planners independently began to use the survey data and created a slide template for including it in the established process for gathering background information to decide whether to initiate a planning process. This practice was identified as a useful way to meet knowledge needs in the organization and integrate new knowledge to existing practices, so rather than replacing this with a perhaps more sophisticated top-down guideline on how to present the utilization of the survey data, it was decided that the practice already in use would be the baseline for wider utilization and developed as necessary together with the planners.

Moreover, while previous studies (Kahila-Tani, Kytta, and Geertman 2019; Kantola, Fagerholm, and Nikula 2023; Reed et al. 2018) have highlighted the use of PPGIS in early stages of planning, our study shows that planners see potential in the use of PPGIS knowledge throughout the processes and for evaluation of the outcomes. The ability to assess the changes of perceived spatial quality over time would provide a valuable source of knowledge for planners to understand the impacts of development.

While organizational silos had different forms in large municipalities like Espoo compared to a small municipality like Ii, the dilemma of sharing knowledge efficiently across silos is shared. Collaboration in self-organized cross-sectoral networks can set the agenda for knowledge sharing, but dismantling of barriers for using data widely and systematically requires resources and shared effort, with coordinators willing to act as knowledge-brokers and silo-breakers both horizontally and vertically among the organization as described by Quitzau et al. (2022). Based on our findings, open communication among professionals and cultivating a positive, development-oriented culture in the municipal organization seem to be key to building the sense that different parts of the organization are working to achieve shared goals and that they have valuable knowledge and expertise that should be disseminated cross-sectorally.

#### **4.2. Requirements for useful participatory knowledge**

As participatory planning aims to build understanding of citizens' needs and approach consensus amongst stakeholders for the best solutions to planning problems (Healey 2003; Innes and Booher 1999), the need to include diverse groups of citizens remains a key objective for development. Planners' views of the reliability and relevance of participatory data were highly affected by how representative they thought it was based on demographic and geographic factors, and they wanted to know about representation before committing to utilizing the information. While planners agreed that mixed recruitment strategies are needed to reach underrepresented groups, they cited resource constraints as a key reason why this was rarely carried out in practice.

For the MyEspoo survey, while varied ways of increasing access were discussed, in this first implementation children and youths were prioritized as a group to be specially targeted. For future data collection, a goal to attract more diverse respondents by using targeted recruitment strategies and third-sector collaboration was identified.

Previous research has shown PPGIS surveys can be used to collect a vast amount of knowledge from a large and relatively diverse audience when the survey design and respondent recruitment strategies are carefully considered (Kahila-Tani, Kytta, and Geertman 2019; Kantola, Fagerholm, and Nikula 2023). Survey tools such as Maptionnaire also allow the analysis of mappings based on different background variables without using external GIS programs, so planners can relatively easily compare results among citizen groups based on for example age, first language or mobility restrictions to identify potential issues of accessibility or inclusion.

For PPGIS knowledge to be usable, previous research has identified that it needs to present novel knowledge at an appropriate stage of a process (Kahila-Tani, Kytta, and Geertman 2019). In Ii, where the PPGIS knowledge was gathered to inform the strategic master plan, the acquired information and ideas provided by citizens focused largely on practical issues, such as maintenance of outdoor recreation facilities. As this was not directly applicable knowledge in the context of the strategic master plan, we developed alternative ways to utilize the knowledge and reduce the likelihood overlapping surveys from being conducted in the future. However, this is also a challenge for cross-sectoral collaboration and knowledge sharing in the municipality and its stakeholders.

#### **4.3. Planners' perceptions of participatory knowledge**

Of the planners we reached, most harboured the impression that there exists a silent majority who is largely content in the planning activities carried out by the municipality, and if only they expressed their views actively, new plans would have wider support. Conversely, the planners believed that those motivated to participate were often the ones with the strongest opposition towards the proposed plans, this belief strengthened by the outright vitriol many planners had been subjected to over the course of their career. The concept silent yet aligned majority seems somewhat unsubstantiated, as there are a multitude of reasons to choose not to participate; for example, low trust in the impact of participation, lack of knowledge, resources or motivation required to engage or the inaccessibility of the process (Barnes et al. 2003).

However, PPGIS may help provide visibility into positive views of the environment that have previously been obscured or help enlighten planners of participants' motivation to protect the values in their living environment, perhaps alleviating planners' concerns about the motivations for voicing opposition to developments. In Espoo and Ii, most of the participants in the PPGIS surveys had previously never participated in planning in any capacity, so thousands and hundreds of, respectively, voices new to planning were included. In both municipalities mappings with perceived quality were included, and approximately 90% of them were perceived as positive. This result aligns with previous findings (for example Kytta et al. 2016) and particularly in Ii impacted the perspective the officials had on the participants' views.

Planners demonstrated conflicted opinions about citizens' feedback which questions the premises of planning projects, as they often felt it was not in their power to use this type of knowledge to set goals for planning, particularly in cases where the land was not owned by the municipality and the project was investor driven. This is problematic from the point of view of participants, who often lack access to early stages of planning and thus lack the possibility to influence the setting of planning goals. In Espoo, the goal of the PPGIS survey was to alleviate this issue by producing citizen knowledge to be used as background material for all future planning projects, as Kahila-Tani, Kytta, and Geertman (2019) have previously suggested. When used as background knowledge, PPGIS inputs could also be used to evaluate the need for development altogether, and planners would have quantifiable citizen data to back their arguments for not developing a particular area based on citizens' wishes.

## 5. Conclusions

In this article, we aimed to provide insights to the factors affecting the use of participatory knowledge in planning practice from the perspective of practitioners. Our findings regarding barriers and enablers for using participatory and PPGIS knowledge align with previous research and provide a deeper understanding of the effects of characteristics and capabilities of individual planners as well as the conditions in the planning organization.

Effective removal of barriers is just a prerequisite for development of practices. The development processes described in this article, particularly the integration of the PPGIS data into the planning system alongside other GIS data, are important because they remove a critical barrier for knowledge integration and further development: making data available to practitioners independently, without having to rely on internal or external support for basic access. This allows development to become more democratic and need-based: as we observed, emergent practices appear where capabilities, agency and positive attitudes are fostered, and form the groundwork for the next cycles of development.

We recommend that future research would delve into the perceptions of the impact of participation from a citizens' point of view and investigate the role of politicians in evaluating and utilizing participatory knowledge in planning decision-making. The planners' perception of a silent majority in agreement with planning proposals should also be investigated more closely. Finally, we recommend developing and conducting evaluation for the impact of participatory knowledge on planning outcomes and investigating the

potential for participatory evaluation and the gathering of longitudinal place-based experiential knowledge to facilitate this.

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SR – conceptualization, methodology, investigation, analysis, writing original draft, review & editing; EH – methodology, investigation, analysis, review & editing; AK – review & editing, supervision; MK – review & editing, supervision.

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