

Exploratory Mapping of Decision Support Tools for Inclusive Spatial Planning in the European Geographical Context

Stockholm, December 2023

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Exploratory Mapping of Decision Support Tools for Inclusive Spatial Planning in the European Geographical Context

Stockholm, 19 December 2023

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1. Introduction

Urbanization is putting a lot of pressure on city planners who need to navigate the many needs that different stakeholder groups have in terms of access to services, infrastructure, and other amenities in urban areas. This, combined with ambitions for more sustainable living environments, often puts planners and practitioners in challenging situations where they need to navigate complex combinations of needs and priorities with limited or little information available for them to use. Given the complexity and the push for evidence-based policymaking, we are witnessing a more or less steady growth of Decision Support Tools and Systems - often referred with the acronym DST and DSS - meant to assist practitioners in planning and designing our cities and living environments.

Decision support can come in many forms. It can be in the form of a book, brochure, manual, flow chart, or other paper formats. Alternatively, it can be in a digital format for use on computers, tablets, or mobile phones. Some are designed as standalone tools that can be accessed and used on the spot with few or no add-ons, while others are meant to function as systems and are designed for use in combination with specific software or datasets.

In relation to this, it is interesting to observe how early years decision support seemed to be developed around the need to support decision makers with decisions that have an economic bearing e.g. land use, pollution levels, management of resources, or with decisions carrying a value-conflict. That resulted in Decision Support Tools often developed around the use of data meant to help practitioners in navigating options and different scenarios.

In recent years this expanded to include Decision Support Tools meant to assist practitioners also in navigating the process dimension. Differently for the data-driven wave of tools, this type of decision support gathers practical insight, best-practices, and experience

accumulated over time by experts about what works and what does not. As such it is not grounded in scientific data, but is the outcome of a trial-and-error process and learning along the way.

As our cities are rapidly expanding and diversity of needs is growing, it is important to have a proper overview and understanding the available tools and their potential to support practitioners in planning and urban governance with the questions and issues they have. In order to fill that gap, we aimed to develop a comprehensive report on the present state of such tools.

This report serves as a summary of our efforts in inventorying and summarizing currently available Decision Support Tools, providing a valuable resource for those engaged in the dynamic field of urban planning and governance.

Box 1: Projected urban growth by 2050

More than half of the global population lives in cities. According to the United Nations Development Programme, 70% of the world's population will be living in cities by 2050.

At the same time, cities are engines of economic growth and progress. UNDP claims that cities generate more than 80% of the global gross domestic product (GDP)

1.1 Decision Support: Definitions, Purpose, and Context

Planning has traditionally been the area of expertise where professionals and experts take central stage. In recent years however, here is an increasing interest for more collaborative approaches to urban planning and design where also nonexperts - e.g. local residents and traditionally less represented groups - can find

a place and have a say about their living environments. However, as the planning profession converges on the need for more inclusive approaches and sets up innovative planning frameworks, challenges remain regarding how planners can effectively design and deliver more inclusive participatory planning processes (Calderon et al, 2022).

Planners might not always have all that is needed in terms of skill set, time, oversight, understanding, and information that is needed to design, set in place and deliver a process that is suitable for a diversity of groups inclusive of children and young people (Rodela and Norss, 2023).

It is interesting to observe how, over the past decades, planning has greatly benefited from research on decision support, witnessing the rapid growth of various decision support tools and systems designed to assist planners and practitioners in their tasks. Many of these tools aim to enhance the efficiency of land use in the face of complex spatial problems, leveraging GIS. However, more recently, there has been an emergence of decision support focused on other 'softer' aspects. Some tools are intended to aid in the design and delivery of more inclusive spatial planning, and it is the objective of this study to survey, map, and report on that body of works. With an interest in how less represented groups appear in that regard, we paid special attention to how such tools are meant to support practitioners in their work with children and young people. Additionally, we sought to understand how the identified tools relate to different aspects of our interest, such as participatory planning, intergenerational justice, creating space, and involvement in spatial planning for young demographic groups.

Box 2. What is a Decision Support Tool?

Decision Support Tools are tools developed with the sole purpose to assist practitioners and policy makers/ decision makers in complex decision making (progression from A to B).

They are developed on the basis of known evidence of what works and what does not, interdependencies and prediction models.

Decision Support Tools can have different formats such books, brochures, manuals, flow charts, or other paper formats. Alternatively, they can have a digital format for use on computers, tablets, or mobile phones.

2. Methods

In this section, we detail the method used for data collection and analysis in this activity. Methodologically, this is a scoping study for which we formulated a protocol and established criteria for the inclusion and exclusion of items for analysis. We accessed both online and offline sources to retrieve information about available Decision Support Tools and Systems.

Considering that the majority of these tools are intended to serve practitioners, planners, and similar profiles we search broadly and included literature such as technical reports, policies, websites, in addition to more academic literature as are journal articles, books and conference papers.



2.1 Identifying DST's designed for sustainable urban planning: the criteria.

To map the types of Decision Support Tools and Systems currently available for use in planning, we conducted searches using popular search engines, such as Google, Google Scholar, Explorer, as well as in bibliographic databases like Scopus and WoS. The languages used for conducting this search were English and Swedish.

For the searches using popular search engines we used different combinations of the following keywords 'Decision support tool', 'decision support system', 'Spatial planning', 'urban governance', 'planning tool', 'urban planning', 'participatory methods', and their corresponding translation in Swedish language as follows 'beslutsstöd verktyg'; 'beslutsstöd system'; 'fysisk planering'; 'stadsstyrning'; 'stadsplanering', 'deltagande*'.

These keywords were used also in searches through bibliographic databases. We screened over the hits and evaluated these against the three inclusion criteria we selected for this study. Those hits that appeared to match these three criteria have been included for further processes, those who did not match have been excluded from this analysis.

During online searches, we came across many different bits and pieces of information about a given DST/DSS, and we soon began to notice how not all tools of interest were explicitly referred to as Decision Support Tools. The scope of this analysis is broad, and we acknowledge

Box 3. What is Spatial Planning?

Spatial planning involves the organization and allocation of land use, and resources, within a chosen geographical area to meet the needs of residents and achieve given goals in local contexts.

Box 4: Selection Criteria

In order to be included in our database, all DSTs identified had to comply with the following criteria:

- 1) They should be designed in the context of spatial planning and urban governance.
- 2) They should have a stated objective in the context of sustainability and participatory planning / participatory governance.
- 3) They had to be geographically located in Europe and Nordic with a special interest in tools developed in and for the Swedish context.

there are differences in when and how decision support is being referred to and what terms are being used.

To address terminological differences and ensure that all relevant material would be properly screened, we decided to consider the objectives and targets reported about the given decision support. Consequently, we opted to include not only those referred to as decision support tools or decision support systems – a commonly used term in geo-informatics and planning - but also those referred to as toolkits, toolboxes, and frameworks when it was clear that these have been developed with the main objective to support complex decision-making processes in relation to spatial planning and urban governance.

Once we identified decision support of interest, we collected information about these into an Excel Spreadsheet and used a Code Book for this purpose.

A limitation of the study reported here is that

Box 5: What is a Decision Support System?

Decision support systems are understood to be a computer-based information systems designed to support policymakers and practitioners in accessing, interpreting and understanding information from data, analyses and models, and help them in identification of possible actions in the context of ongoing decision-making processes. These may integrate geographic information system (GIS) data, socio-economic data, environmental data, and other relevant information to provide a comprehensive understanding of the spatial context (Arnott and Pervan, 2005, McIntosh et. al., 2007)

we identified tools for which information is publicly accessible and that we limited our searches to information available in English and Swedish.

3. Results and Discussion

The above-described step-wise process led us to the first identification of 60 items. However, after closer scrutiny of our inclusion criteria, we selected 21 items suitable for further analysis, and information about these has been extracted and then included in an Excel file for analysis.

Geographic distribution of selected decision support

This project has focused on identifying decision support developed in a European context of praxis and policy. In this sense, our sample has been limited to tools and systems designed and/or developed by groups of teams based in Europe. In this we report that there is a predominance of selected decision support

developed in northern Europe (9), followed by multiple European countries (5). Some were designed and/or developed by global networks or NGOs (2), and by teams in southern and central Europe (4) and (1) was developed in the US but tested and used in multiple European countries.

Groups at focus in selected decision support

As stated by Geekiyanage et al (2021), even though vulnerable communities are often the most affected by planning interventions these most often would receive less attention. Also, for this reason there is a need for participatory processes to be paying special attention to how residents in vulnerable communities are involved in planning.

During our search we were interested in understanding whether the decision support selected for inclusion in our study would have an expressed interest or aim in considering less represented groups. We understand less-represented groups as demographic or social groups who have a smaller presence, visibility, or influence within a given context or community compared to the dominant or more represented groups. These groups may include individuals from various backgrounds, such as ethnic or racial minorities, marginalized communities, or those with limited access to resources and opportunities. They can be characterized by socio-economic factors (unemployed people), gender identification (ex. LGBTQ+ community), demographic (ex. Youth), etc.)

The results of our study shows that that 57% of the selected DSTs are not designed with a specific focus on this aspect, while 43% explicitly aim to address and support less represented groups.

Further to this we were interested in if and how decision support has been designed and developed with the intent to support practitioners in their work with children and young people as a special category of less represented groups. Collected data shows that out of all the selected tools, only 4 (19%) have an explicit focus on youth, while the remaining 17 (81%) do not.

Availability of the decision support selected

Ease of access to decision support will greatly influence when and how much these will end up being used by practitioners. We wanted to map out this aspect as well. Thus, in addition to collecting information and data about decision support we also traced how easy is to access them, and if they are available at all.

We found that despite information about selected decision support is generally available, access to some of these was not always possible. By the date of our last search (14th of November 2023), out of the 21 decision support tools selected we could access 13 while the remaining 8 proved to be not accessible. For instance, in some cases the website associated with the decisions support would not be available, or, in other cases despite general information being available it was not clear how to gain access to that decision support. In other cases, the decision support might have been developed and tested as a part of a research project but after the completion of the project it was not clear if it is still possible to use it and how to access it. We found that 11 have been developed as part to research projects.

We acknowledge the challenge of keeping such decision support updated and well-functioning and particularly those who rely on ICT end up become outdated fast. Also, we are aware that some are meant to support expert profiles and might be available via restricted, or more internal, networks circulating through different routes.

Data types presented on DSTs

Decision support tools are designed to aid urban planners and decision-makers in navigating complex decision-making processes. They are sought after for evidence-based type of decision making and are tailored to help users navigate intricate and ever-changing scenarios. In this regard, the scientific data presented within these tools plays a pivotal role, enabling a wide array of analyses and assessments. There exists a prevailing tendency in this field to emphasize

advanced Information and Communication Technology techniques, predominantly focusing on the interactions between economic and biophysical systems. Unfortunately, this often results in more qualitative data being addressed only to a limited extent, as noted by Rotmans et al (2000) and Mathias et al (2020).

One noteworthy observation from our mapping is the occasional lack of transparency regarding the types of data incorporated into these tools. Many tools utilize Geographic Information Systems (GIS) and socio-economic data, yet the precise origins of this data and the specific variables considered remain ambiguous. However, what remains consistent across these tools is the general lack of clarity concerning data sources and, especially for qualitative data, the methods of its development, the context in which it was created, and the individuals responsible for its generation.

We postulate that this lack of clarity might stem from the fact that the target users, namely urban planners and decision-makers, likely prioritize ease of use and readily available, fully developed tools over detailed information regarding data origins.

Two main types of DSTs identified

Across the Database that we curated, there seems to be two main types of DSTs identified. The first category comprises of 7 frameworks or guidelines aimed at offering urban planners and decision-makers guidance on a given matter, that would take the form or a step-by-step process or a roadmap for replication in other contexts (Eg. The toolkit ‘So you want to consult with children? Or the “Hercity” toolbox). These provide a wealth of information, access to different support resources, links to existing policies, frameworks and research that are pertinent to the specific topic. These tools present users with potential roadmaps to navigating different projects and circumstances and support them with useful and previously tested methods and approaches that can support them in the process of conducting their work. These guidelines and frameworks are typically built upon prior research.

ch and successful experiences by researchers, institutions, NGOs, and other relevant entities.

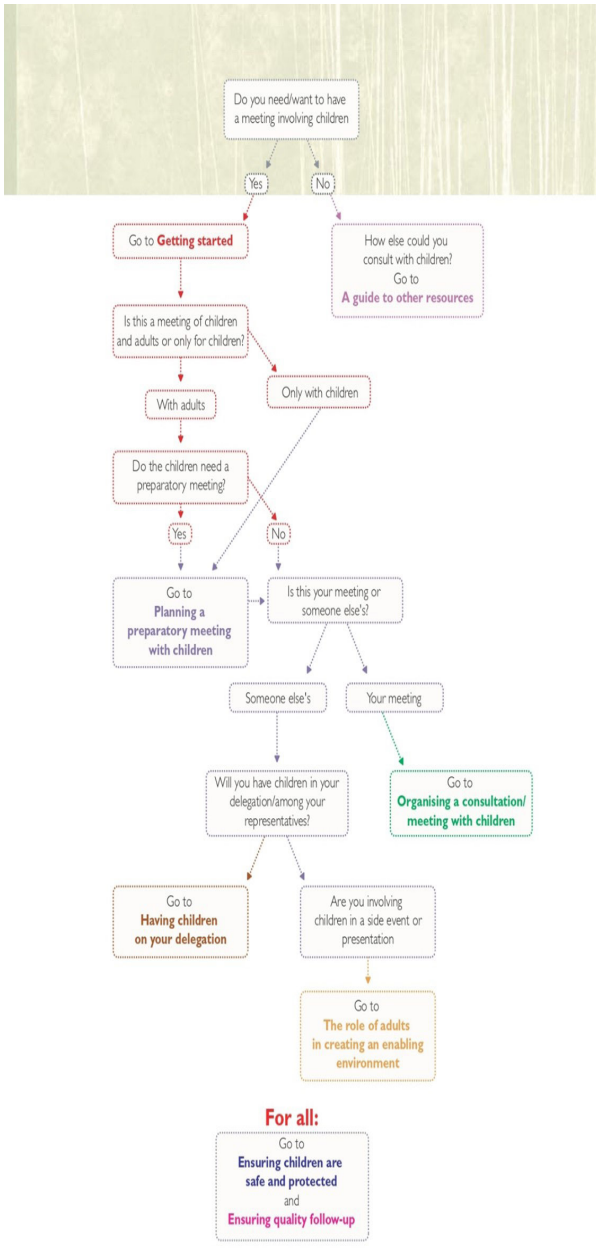


Image: Visual extracted from the toolkit ‘So you want to consult with children? A toolkit of good practice’ presenting a pathway towards children’s inclusion in consultations at national, regional and international levels (pp 14).

The second category of consists of 14 decision support tools, which take the form of data aggregators, often enabling planners and decision-makers to visualize diverse data types within a single, integrated tool. This funcio-

nality empowers users to assess, project, and observe variations, ultimately facilitating informed decision-making processes. These types of tools would most often serve to develop different potential scenarios which practitioners could use to inform decision-making process.

The data used in such cases would most often be quantitative and be relying on environmental measurements, geolocation, risk assessment data, etc. In such cases, there is a prevailing focus on the physical and economic aspects. In this sense these would be oriented at understanding interactions between the economic and biophysical system, whit less consideration, or no consideration at all, for the social system.



Image: View of the Communityviz software that allows the user to visualise maps together with other relevant variables such as land use, population density, infrastructure, and environmental data.



4. Conclusions and recommendations for future research

In the view of current policy objectives at the European level which see city administrations driving the green transition, it is of great interest to understand what tools are available and how easy or not these can be accessed by city planners and other practitioners when working on questions in the context of more sustainable living environments and green transition. We wanted to have a closer look at that.

Therefore, the research reported here has systematically identified and scrutinized 21 decision support tools and systems developed within the European context of praxis and policy, allowing us to identify some aspects of interest and emerging trends.

Predominantly concentrated in northern Europe, we find how these tools aim to assist urban planners and decision-makers in navigating complex decision-making processes. However, challenges related to accessibility and a lack of explicit focus on less-represented groups, including youth, underscore the need for ongoing improvements. While the selected DSTs offer valuable guidance, our findings reveal a prevailing emphasis on advanced Information and Communication Technology techniques, often at the expense of more qualitative data representation. Also, we find that transparency regarding data sources remains a challenge, posing potential limitations to informed decision-making.

This study's insights hold relevance for urban planners, decision-makers, and researchers engaged in spatial planning within the European context. In addition to giving an overview of existing decision support, practitioners can also benefit from further considerations about how such tools can be used and when. In this study, we underscore the importance of addressing accessibility issues and fostering inclusivity which we consider could help practitioners critically evaluate how and when they

engage local populations in such questions.

Looking ahead, future research could benefit from a focus on enhancing the transparency of data sources and methodologies. Additionally, exploring innovative ways to bridge the gap between advanced ICT techniques and more qualitative data representation could give better opportunities to practitioners. Future studies could consider studying tools which are explicitly designed for work with less-represented groups, such as youth, ensuring that spatial planning efforts are inclusive and responsive to diverse societal needs. Also, as the field continues to evolve, it is interesting to consider how a more nuanced understanding of decision support tools' role in facilitating sustainable, equitable, and resilient urban development might serve to open debate and shape the future of spatial planning in Europe.

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