



Project Report, SDG 11

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Abstract

The urban population is projected to double by 2050, resulting in around 70% of people living in urban areas. (World Bank 2023.) Team IncluCity focused on the challenge of getting people involved, engaged and making them care about their urban environment.

Our solution, an AI-based robot named Aili, aims to enhance citizen participation in urban planning. Aili's core value proposition lies in its ability to amplify the collective voice of citizens. By providing an accessible and user-friendly platform for feedback and participation, Aili bridges the gap between citizens and decision-makers, enhancing a sense of involvement and achievement among its users.

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1 Introduction

The purpose of this chapter is to provide the reader with a comprehensive understanding of the report's scope and significance. Sustainable Development Goal 11 (SDG 11) aims to make cities and human settlements inclusive, safe, resilient, and sustainable. Urbanization, while a driving force for economic growth and social development, presents significant challenges that need addressing to ensure cities are livable and equitable for all residents.

In this chapter, we will delve into the specific issue related to SDG 11 that our group has identified as particularly pressing. That issue being "How do we motivate people to participate in urban planning". This problem, rooted in the complexities of urban development and management, reflects broader global challenges, such as inadequate infrastructure, lack of affordable housing, environmental degradation, and social inequality. It is worth noting that a positive byproduct of people participating in decision-making is increased signs of care.

Our analysis will present a proposed solution that we believe offers the most effective approach to addressing this problem. This solution is grounded in thorough research and incorporates innovative strategies that align with best practices in urban planning, citizen engagement and sustainable development. We will discuss the rationale behind our proposed solution, detailing how it can be implemented and the potential impact it could have on achieving larger targets set by SDG 11.

Furthermore, cities are the epicenters of cultural, political, and economic activities, and their development patterns have far-reaching implications. Ensuring that cities are inclusive and sustainable is not only crucial for the well-being of current urban populations but also for future generations. By focusing on this goal, we contribute to the global effort to create a more equitable and sustainable world.

In the end, this chapter sets the stage for the subsequent sections of the report, providing a foundational understanding of the problem at hand, the proposed solution, and the overarching importance of sustainable urban development. Through this exploration, we aim to underscore the critical nature of one of the elements of SDG 11 and the necessity of collaborative efforts to achieve its objectives.

1.1 What - The Biggest Problem

Rapid urbanization is reshaping the world's population distribution, with over half the global population now living in urban areas. This shift is expected to continue, significantly impacting developing regions like Africa and Asia. According to the World Bank (2023), 56% of the total world population, or approximately 4.4 billion inhabitants, currently reside in cities. If this trend continues, the urban population is projected to double by 2050, resulting in around 7 out of 10 people living in urban areas. (World Bank 2023.)

This rapid urban growth presents numerous challenges. Overcrowded cities face immense pressure on existing infrastructure, leading to social and economic inequality, inadequate housing, strained public services, and congested transportation systems followed by a reduction in productivity. Environmental degradation is another pressing issue, as urban expansion often damages or consumes the natural habitat of existing animals, reducing biodiversity and increasing pollution levels. Moreover, urban areas are becoming increasingly vulnerable to the impacts of climate change, such as flooding, which can overwhelm drainage systems, and urban heat islands, which exacerbate temperature extremes. (Palanivel 2017.)

These challenges underscore the urgent need for comprehensive strategies to manage urban growth sustainably and responsibly where existing areas are utilized as efficiently and as desirably as possible followed by continuous care for the surroundings. Effective urban planning and governance are crucial to address these issues, ensuring that cities can support their growing populations while maintaining a high quality of life. Sustainable development practices, including the promotion of green spaces, investment in renewable energy, and resilient infrastructure, are essential to mitigate the adverse effects of rapid urbanization and climate change. The integration of these strategies is vital for creating cities that are inclusive, safe, resilient, and sustainable for future generations.

1.1.1 Problems regarding participation

Individual citizens' opportunities to directly influence urban planning are considered quite weak. The best way for citizens to exert influence is through various "network mechanisms," such as political parties and associations. While individuals can be heard, their initiatives rarely succeed without considerable time and resources. As a result, urban planning agencies rarely see such proposals. (Mäenpää, Aniluoto, Manninen and Villanen 2000, pp. 88-89.) Leino (2006, p. 146) points out that citizens feel alienated by the complex and abstract nature of party politics.

According to Häkli (2002, p. 117), a challenge with planning that seeks open participation is that experts and the city administration often determine the variables of the planning situation before the actual planning process even starts.

Institutionalized participation is not just an alternative method of involvement but also a distinct form of political engagement for citizens. This can influence how politics and democracy are perceived in modern societies. The issue of disinterest may stem from an institutional politics that overly focuses on associations. What might occur if the administration embraced forms of participation more aligned with the ethos of noninstitutional participation? (Ganuja Fernández and Francés García 2015, p. 256.)

1.2 How - Solution

Addressing the challenges of urbanization requires integrated urban planning, significant investment in public transportation, the development of green spaces, and the provision of affordable housing. However, in our project's scope we will focus on understanding how to keep people involved, engaged and make them care. Additionally, maintaining these initiatives and ensuring their continuous functionality is crucial. Preventive maintenance, encompassing seven key steps—testing, servicing, calibration, inspection, adjustment, alignment, and installation—should be applied to these activities to ensure their long-term success (Mobility Work 2022).

"Building climate resilience and addressing climate-related risks are also critical components of sustainable urban development. Cities worldwide are taking proactive steps to enhance resilience through initiatives such as the 100 Resilient Cities program, supported by global organizations like the World Bank, ICLEI, and UN-Habitat. These efforts focus on providing technical support, fostering commitment, securing financing, and promoting collaboration to effectively implement adaptation and resilience strategies" (World Bank; Resilient Cities 2019).

In our opinion, integrating comprehensive maintenance practices and prioritizing climate resilience followed by motivation of people to make a difference and have their voices heard, cities can better manage the challenges of rapid urbanization and climate change, ensuring sustainable and resilient urban environments for future generations.

1.2.1 Solution regarding participation

Incorporating social inequality and exclusion considerations during the initiation, deployment, and assessment of smart city projects, combined with a bottom-up civic engagement approach, can enhance the ability of smart cities to address the needs of diverse populations. This approach fosters more equitable and inclusive outcomes, improving the overall quality of life for all residents. (Chen, Ramon Gil-Garcia and Gasco-Hernandez 2022, p. 143.) According to Leino (2006, p. 146) citizens find participating in the planning of their own residential area significantly more meaningful, as their own neighborhood and its future are seen as clear and concrete issues that directly impact them.

Non-institutional forms of participation are positively associated with individuals' trust in society and how often they discuss politics. This implies that higher levels of societal trust lead to a greater likelihood of individuals engaging in political activities through non-institutional channels. (Ganuza Fernández and Francés García 2015, p. 249.) Direct citizen participation, such as in urban planning, has increased the visibility of municipal decision-making and made the reasoning behind decisions more transparent (Leino 2006, p. 146).

Leino (2006, p. 146) has noted that residents have become more demanding, making the political decision-making process at the local level less straightforward than it used to be; nowadays, issues require more extensive discussion and debate. At team IncluCity, we see it is crucial to involve citizens early in the planning process in a way that benefits both sides. When participation is made more approachable and non-institutional, citizens feel heard and engaged. Decision-makers can then better understand and respond to citizens' needs, improving their quality of life.

1.3 Why - Human Truth and Insight

At the core of SDG11 is the universal human need for a safe, accessible, and healthy living environment. Sustainable urban development not only addresses these needs but also promotes well-being, economic opportunity, and environmental protection. Recognizing that well-managed cities can be powerful engines of growth and innovation underscores the intrinsic value of sustainable urbanization for the well-being of all. With this in mind, involving people in decision making for their immediate area of residence is as crucial as ever. Individuals tend to care more for something they have put at least a little effort in. For example, if residents are asked to plant a tree in their local park, they will show and do more care for said tree as that is the result of their own decision and work. This is known as the IKEA Effect. (Norton, Mochon, and Ariely 2012, pp. 453-460.)

Everyone deserves a safe, accessible, and healthy environment to live in. This fundamental human right emphasizes the importance of cities that are inclusive and sustainable. In practice, sustainable urban development ensures that all citizens, regardless of their socioeconomic status, have access to essential services, clean air and water, green spaces, and efficient public transportation. Moreover, sustainable cities are designed to enhance overall well-being by reducing pollution, promoting physical activity through walkable communities, and providing spaces for social interaction. Economic opportunities flourish in well-planned urban areas, as sustainable practices attract businesses and investors, create jobs, and stimulate local economies. By integrating sustainable practices into urban planning, cities can reduce their carbon footprint, conserve natural resources, and protect biodiversity. (UNEP 2023; National Geographic 2023; UN Suriname 2023.)

We believe that environmental protection is another critical aspect of sustainable urban development. Cities that prioritize green infrastructure, renewable energy, and waste reduction not only mitigate environmental degradation but also enhance resilience to climate change. Urban areas that implement sustainable water management practices, for example, can better withstand droughts and floods, safeguarding both their populations and their

economies. Ensuring these critical elements for every city's successful development will open resident's mind more for ideation and care.

Furthermore, recognizing the interconnectedness of these elements highlights the intrinsic value of sustainable urbanization. Well-managed cities are not just about infrastructure and services; they are vibrant communities where innovation thrives, cultures blend, and residents enjoy a high quality of life ideally design of which has been contributed to by themselves. Sustainable urban development fosters a sense of community and belonging, encouraging civic engagement and social cohesion.

2 Development Approach

The approach to the development work is based on design thinking, service design and service design methodology.

Design thinking is a “a systematic and collaborative approach for identifying and creatively solving problems” (Luchs 2015, p. xxi). Design thinking is a way to find viable ideas or solutions to complex problems of a specific group of people. Most scientific approaches try to describe problems analytically and reduce the complexity of the problems. This is not possible in design thinking, where problems and viability of the solutions are decided from the perspective of the users. (Plattner, Meinel and Leifer 2010, p. 4.)

Due to the time schedule how the project work was organized, the work was divided into two parts: First part consisted mainly of background research and defining the problem by using service design methods. The second part took place in CERN, and during that part the approach was mainly based on the design sprint introduced by Knapp, Zeratsky and Kowitz (2016).

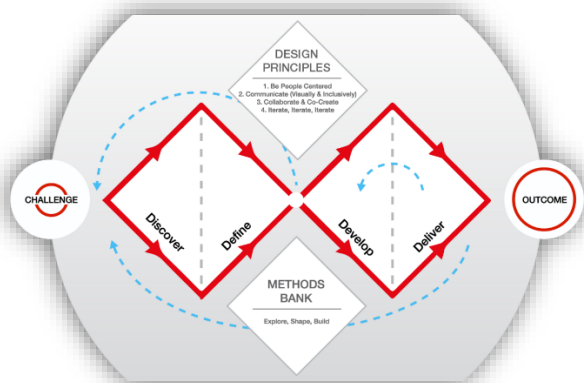
2.1 Service Design

Service design is “a human-centered, collaborative, interdisciplinary, iterative approach which uses research, prototyping, and a set of easily understood activities and visualization tools to create and orchestrate experiences that meet the needs of the business, the user, and other stakeholders” (Stickdorn, Hormess, Lawrence and Schneider 2018, p. 26).

Service design can be seen as a mindset, process and a toolset. It can be seen as a mindset where the customer or user is put first, and the service is seen as a relationship. Service design is a process that is driven by a design mindset and includes several iterative rounds of research and development. Service design uses a broad set of tools that help to create understanding and develop the right services that meet user's needs. Service design helps to create a shared language between multidisciplinary stakeholders. (Stickdorn et al. 2018, pp. 20-21.)

Stickdorn et al. (2018) have introduced six principles that define the core of service design: Human-centered - user or customer is put into center of the design process and the designers want to understand what everyone affected by the service are experiencing. Collaborative - designing is done in collaboration with all relevant stakeholders, and they are actively engaged in the process. Iterative - the service design process is exploring and experimenting, “iterating towards implementation”. Sequencing - the service needs to be visualized and broken down into smaller parts and actions that are interrelated. Real - the design process is conducted in real life, and immaterial added value needs to be evidenced. Holistic - the service needs to address all stakeholders' needs in a sustainable way during the service process. (Stickdorn et al. 2018, p. 24 and p. 26.)

The service design process is often described as including several phases. The Design Council (2024) has created a visual representation of the process called Double Diamond. It describes the general model and the steps taken regardless of which methods or tools are used during the process. The Double Diamond has four phases: 1) Discover: This phase helps to understand the problem and how people experience it. 2) Define: Defining the actual challenge by using insight created in the discovery phase. 3) Develop: Finding different answers to the defined challenge and co-creating solutions with other people. 4) Deliver: Testing the solutions as small-scale prototypes and improving the ones that work. The Double Diamond framework for innovation is an iterative process and different phases of the process may be repeated if needed. Inside Double Diamond innovation framework it is possible to use numerous methods. Design principles defined by the Design Council are putting people first, communicating using visual and inclusive methods, collaborating and co-creating and iteration. (Design Council 2024.)



Source: Design Council 2024

Picture 1: Double Diamond Framework for Innovation by Design Council

In our design process we followed the Double Diamond framework and started our work by looking for information, doing research and trying to understand the subject better. As we gathered information, we started defining the challenge to be solved. As we chose the one challenge and question to solve, we moved to the second part of the Double Diamond. Most of the developing solutions phase was done in CERN. Our process ended in producing and introducing the prototype, so the last part of continuous development and building the final product was never done during this study program.

2.2 The Design Sprint

The design sprint is a process of developing something in an intensive five-day period. It includes prototyping and testing ideas with real customers (Knapp, Zeratsky and Kowitz 2016, p. 15). The method has been developed by experts in Google Ventures to be used when sparring with their startup partners (Knapp et al. 2016, p. 10). The sprint provides a tool set to find the right direction, ideas, and solutions as well as experiment and test them in a fast-forwarding process. It combines well-known tools and new approaches into an easy-to-use package to run a design sprint. (Knapp et al. 2016, pp. 21-23.)

In our case the team structure was decided during our Kickoff meeting, and it was based on our personal interest instead of our expertise on the subject. In the Design Sprint model there are also strict instructions on how to organize the work and what kind of time schedule to follow (Knapp et al. 2016, pp. 22-23 and pp. 41-46). In our case we didn't follow the original model that strictly but applied it more flexibly.

Usually, the sprint week starts by taking a look at the end result of the sprint, and defining the long-term goal and difficult questions that need to be answered (Knapp et al. 2016, pp. 50-51). In our case this phase wasn't done during the intensive week but as longer research and defining process during the spring. We also gathered information and interviewed experts to define our problem to be solved. Most of the information gathering was done before the intensive week.

The next phase in design sprint is finding solutions amongst the existing ideas and to start sketching new or more concrete ones. The sprint team starts looking for existing ideas, so that those could be remixed and improved into the final solution. (Knapp et al. 2016, pp. 81-83.) While sketching everyone can think about the same problem or sometimes it is useful to split into smaller task groups to tackle smaller parts of the problem (Knapp et al. 2016, p. 84). In idea generation the sprint team can first create rough ideas and then develop the strongest ideas further (Knapp et al. 2016, pp. 90-91).

Next it is time to decide which solution the sprint team wants to prototype (Knapp et al. 2016, p. 102). All solution ideas and sketches are placed sparsely on a wall for the whole team to see. All members of the team review the solutions in silence and mark dots next to all parts that they see as interesting. Any concerns or questions are written on sticky notes and placed under the sketch. The dots create a heat map, which shows which solution may be the most interesting. (Knapp et al. 2016, pp. 105-107.)

Each solution's highlights are quickly discussed, and any appearing big ideas are written on sticky notes - this creates a list of the most promising ideas. The team reviews all concerns and questions that have been written on sticky notes and decides on the solution, for example by voting. (Knapp et al. 2016, pp. 105-111.) In a case that there are several winning ideas, the team can for example make several competing prototypes or combine ideas in one prototype (Knapp et al. 2016, p. 115).

After deciding it is time to make a plan for prototyping. The plan can be made in the form of a storyboard (Knapp et al. 2016, p. 119). It is also possible to use some of the ideas from the not-winning sketches if they fit into the big picture. The prototype should be kept simple - there should be just enough details so that the test customer knows what is going to happen next. The prototype can have parts that don't work. Some details can also be decided while building the prototype. (Knapp et al. 2016, pp. 122-123.)

The prototype is an illusion of the product made with a prototype mindset: "perfect to just enough, from long-term quality to temporary simulation". There are some principles in making prototypes. You need to believe that it is possible to prototype anything. The prototype is a façade of a product, and it is disposable after the test is finished. The prototype needs to appear real enough that you get genuine reactions from the customers in the test. (Knapp et al., pp. 129-131.) To be able to create a prototype in few hours, it is necessary to divide tasks and parts of the solution to different people (Knapp, Zeratsky and Kowitz 2016, pp. 145-148). There should be a trial run of the prototype early enough, so that any problems and gaps can still be fixed before the test (Knapp et al. 2016, p. 150).

3 Evolution of the Design

3.1 Initial Measures

The planning process began once the groups were formed during the Kick-off days. We started by each sharing which aspects of SDG (Sustainable Development Goals) 11 interested us,

giving us an initial understanding of our team's areas of interest. After the Kick-off days, we created a Miro research board where we started compiling our findings.

3.2 Intent Statement

Originally, our intention was to create a concept for City 2.0, aiming to enhance the quality of life by integrating diverse options and sustainability into urban living. This new vision seeks to blend the best aspects of rural and urban environments, offering a redesigned city that meets the needs and aspirations of its residents and community members. By addressing the opportunities for better life quality and sustainable living, City 2.0 aims to provide a balanced and enriched living experience. However, after thorough consideration, we realized that this scope is too big of a beast to tackle, and we began narrowing it down. In the end, we arrived at the conclusion that the scope we would like to work on would be how to motivate people to care and be involved in urban design as we have identified a big "I don't really care" attitude problem in general populace.

Furthermore, to the target group, we have identified them to be people with needs but no means. In simpler terms, people who want to influence and make a change in their day-to-day life surroundings, but lack leadership, guidance or assistance from society, either from friends, the city or even government which causes their voices not to be heard. People who need to relate to likeminded individuals to form their ideas, strengthen their voice and speak up.

A critical component of the solution involves fostering a sense of ownership, care and responsibility among residents. This can be achieved through initiatives that encourage direct participation in planning, upkeep and enhancement of their surroundings. For instance, preventive maintenance strategies encompassing testing, servicing, calibration, inspection, adjustment, alignment, and installation can ensure the long-term functionality and success of urban projects. Such initiatives not only maintain infrastructure but also involve citizens in hands-on activities, fostering a deeper connection to their environment. By engaging residents in tasks like planting trees or maintaining public spaces, the community develops a personal investment in these projects, leading to greater care and stewardship.

The concept of climate resilience is also central to the proposed solution. Cities worldwide are increasingly vulnerable to climate-related risks such as flooding and extreme heat. Building resilience involves implementing strategies like the 100 Resilient Cities program, which supports urban areas in enhancing their capacity to withstand and adapt to these challenges. These strategies include technical support, securing financing, and fostering collaboration among stakeholders to develop and implement effective resilience measures. Prioritizing climate resilience not only mitigates the adverse effects of climate change but also ensures that cities remain livable and sustainable for future generations.

Another vital aspect of the solution is the integration of sustainable urban development practices. These include promoting green spaces, investing in renewable energy, and developing resilient infrastructure. Sustainable urban development ensures that all citizens, regardless of their socioeconomic status, have access to essential services, clean air and water, green spaces, and efficient public transportation. By reducing pollution, promoting physical activity through walkable communities, and providing spaces for social interaction, sustainable cities enhance the overall well-being of their residents. Furthermore, economic opportunities flourish in well-planned urban areas, as sustainable practices attract businesses and investors, create jobs, and stimulate local economies.

The human-centered design principles underpinning this approach emphasize the importance of understanding and addressing the needs and experiences of all stakeholders. Service design methodologies, such as the Double Diamond framework and the Design Sprint, guide the process of identifying challenges, generating solutions, and testing prototypes. These

iterative processes ensure that the solutions developed are practical, innovative, and tailored to the specific needs of the community. By involving residents in the design and implementation phases, cities can create more effective and sustainable solutions that reflect the collective aspirations and insights of their populations.

Ultimately, the proposed solution aims to transform urban areas into vibrant, inclusive, and sustainable communities. Well-managed cities are not just about infrastructure and services; they are dynamic hubs where innovation thrives, cultures blend, and residents enjoy a high quality of life. By prioritizing sustainability, citizen engagement, and climate resilience, cities can become more than just places to live and work. They can evolve into spaces that foster a sense of community and belonging, driving progress toward a more equitable and sustainable future for all. This comprehensive approach aligns with the larger objectives of SDG 11, contributing to the global effort to create a more inclusive, resilient, and sustainable world.

3.3 First Meeting on Teams

In our first Teams meeting, we decided that everyone should explore research and content related to SDG 11. We did not assign specific topics to individuals, allowing each person to investigate according to their interests. Before our first in-person meeting, everyone was asked to consider the significance of geographical location, city districts or target areas, and target groups in relation to our topic. Additionally, each member was assigned to research 1-2 SDG 11 targets and their indicators, with the essential features and goals to be placed into a PESTEL framework.

3.4 Second Meeting, Live at Oodi

In our first in-person meeting at Oodi, we presented our findings to each other using the PESTEL framework. The team had markers and post it notes on which team members wrote down the phenomena or themes they observed. These post it notes were then placed on a whiteboard for everyone to see.

After presenting the PESTEL charts, we organized the post it notes into three clusters: infrastructure, services, and community.

The infrastructure cluster included the use of environmentally friendly building materials and the revision of building material policies, preparing for extreme weather conditions in urban planning, increasing urban greenery, improving easy recycling solutions, addressing floods and droughts in different areas, developing alert systems for crises, managing air quality and pollution, maximizing recycling, and minimizing landfill and ocean dumping.

For services, the key observations were enabling access to basic services through walking and cycling, providing services on wheels, accessible basic services in urban areas, promoting the use of public transportation, addressing inequality based on social status, creating a diverse transportation system, ensuring safe green areas in urban planning, and preparing for disasters.

The community-related observations focused on reducing homelessness, citizen participation in decision-making, various participatory structures, gamified air quality improvement, urban residents' ownership of parks, preventing pollution through health-promoting changes, increasing public awareness, citizen involvement in urban planning, incentives for resident participation, and the maintenance of public areas.

From the three clusters, we analyzed and distilled three themes:

1. Community power in city planning: People want to shape their cities. The key points were to focus on amplifying citizens' participation in urban planning, encourage active

- community involvement in the stewardship of the city and enhance citizens' power and influence over local decision-making processes;
2. Green and safe infrastructure. The key points were the development of dedicated spaces catering to community needs, the importance of safe green spaces and preventive urban planning, and consideration of how natural environments can be integrated into urban settings for community welfare;
 3. Accessibility in inclusive urban living. Key points were advocating for accessible and comprehensive services within cities, promoting various means of transportation that ensure access to services for all, and striving towards creating cities that are universally accessible and accommodating for all individuals.

At the end of the meeting, we decided that for the next meeting, everyone will prepare a two-minute presentation on a topic of interest to them related to one of the three themes we distilled, or on one of the ATTRACT technologies.

3.5 Third Meeting on Teams

In our third meeting, we went through the two-minute presentations, the key observations of which were compiled into a poll unit for voting. The voting was to be completed before our next meeting and can be found here: <https://pollunit.com/polls/rldaio9jvolqt8yiyyngga>

3.6 Fourth Meeting on Teams

The winning topic of the poll was “How to involve citizens in urban and land use planning? The phenomenon where people value or appreciate more what they have created themselves is known as the “IKEA effect”. Involvement of residents in the creation process leads to a stronger connection to the urban environment, potentially resulting in more successful and sustainable urban spaces (Harvard Business Review 2012).

We agreed to delve deeper into the topic, gather perspectives from within the winning topic, and refine the subject with a new vote which was to be completed before our next meeting. Link to the voting: <https://pollunit.com/polls/tkadnn4ppensvl5ke6gncg>

3.7 Fifth Meeting on Teams

The winning topics of the second voting were:

1. Understanding disengagement: Explore why some residents feel disconnected from urban planning processes to tailor more engaging strategies;
2. Inclusive participation regardless of resources: Develop programs that ensure all community members can participate in planning, regardless of their economic resources.

Next step was to read more about the topics. We began searching for interviewees who could provide diverse perspectives on inclusive urban participation and the related challenges. We also started designing the interview questions.

3.8 Sixth Meeting, live at Oodi

In our sixth meeting, held in person at Oodi, we discussed the insights gained from the interviews conducted so far. The interviews helped clarify the problem statement. At this stage, the problem was summarized as follows: People don't participate because they feel they are not heard, and their input doesn't have any impact.

For the first time, we began suggesting ideas for the final solution. All suggestions were related to an AI-based online service that helps citizens access information on urban development projects. This will be covered in more detail in chapter 4.

3.9 Interviews

One of the key elements of our research consisted of qualitative, semi-structured interviews.

For the recruitment of interviewees, we wanted to focus on finding experts representing different perspectives on the same topic and were successful in that goal. We used our networks and recommendations from our teacher to find suitable candidates, for whom we scheduled individual interviews with.

Based on our research question and previous workshop at Oodi we prepared our interview template that would be used with all the interviewees. The interview followed a semi-structured process meaning while key topics and outlines of the questions were the same for all, the interviews would be adjusted based on the answers of the candidate and the flow of the discussion.

One-hour interviews were conducted and recorded for further analysis and individual extraction of information. Further analysis of the interviews would be reserved for the week at CERN.

3.9.1 Kaisa Schmidt-Thomé, Leading Researcher at Demos Helsinki

In an interview with Kaisa Schmidt-Thomé, leading researcher at Demos Helsinki, several key challenges and successes in urban planning inclusion were highlighted. One significant challenge is the difficulty in engaging a diverse range of opinions. Often, citizen engagement results in similar preferences among the broader public and stakeholders, and some groups, particularly ethnic minorities, may not participate unless the process is made engaging and accessible. Financial barriers further complicate involvement, especially for ethnic retail hubs with complex ownerships and temporary rental agreements, and for communities like Muslims, who face challenges in financing a mosque through donations. Political and social barriers also prevent marginalized groups, such as undocumented individuals, from being represented in urban planning.

Despite these obstacles, there have been notable successes in promoting inclusion. Direct engagement strategies, such as interviewing people in their communities and using interpreters, have been effective, even if not always representative. Additionally, multidisciplinary interventions in city district development projects, allowing residents to suggest measurements and receive funding, have built trust and demonstrated the city's commitment to understanding local needs.

Improvements in inclusion efforts involve increasing outreach by city planners, moving beyond inviting people to city hall and instead meeting them in their communities. Inclusive funding strategies are crucial, recognizing the needs of different groups and ensuring they have access to necessary resources. Long-term engagement, moving from punctual interventions to sustained involvement, helps build trust and a sense of belonging. Addressing politically sensitive topics, such as the needs of undocumented individuals and migrants in flood-prone areas, is essential for comprehensive urban planning. Additionally, making the engagement measures and content interesting to citizens is vital to spark their participation.

Looking to the future, technological integration is a key trend. Mainstreaming public participation through digital means, such as collecting geocodes and marking problem areas on maps, can enhance the inclusivity and effectiveness of urban planning. Interdisciplinary approaches, utilizing anthropologists, geographers, and ethnography-based consultancy, can

provide deeper insights into community needs and improve planning outcomes. Combining digital engagement with physical encounters in natural surroundings ensures broader and more meaningful participation.

In conclusion, Kaisa Schmidt-Thomé emphasizes that addressing the challenges of inclusion in urban planning requires a multifaceted approach. This includes direct engagement, inclusive funding strategies, long-term commitment, and the integration of emerging technologies. By actively involving underrepresented communities and ensuring their diverse viewpoints are reflected in planning outcomes, cities can foster more inclusive and sustainable development.

3.9.2 Katja Alaja, Citizen Activist in Helsinki

In an interview with Katja Alaja, an activist living in Jätkäsaari, Helsinki, several key aspects of her efforts to establish a winter swimming spot in the area were discussed. Katja founded the Jätkäsaari Cold Water Swimmers group to pursue this goal, as there currently isn't a winter swimming facility in Jätkäsaari.

Katja faced several challenges in her activism. Activating the community is difficult, as motivating people to participate actively remains a significant hurdle, despite widespread support for the cause. Interaction with city officials can be challenging, as they may not always be motivated and can have biased attitudes towards proposals. Discussion events with city representatives often fall short of expectations, limiting citizen participation. Additionally, activists frequently need to organize resources and facilities themselves, and the city's processes are perceived as cumbersome and slow, with long intervals between OmaStadi voting processes making continuous participation challenging. There is also a lack of clear communication regarding project progress and the city's commitment to implementing ideas.

Despite these challenges, Katja has achieved several successes. She has successfully created and grown the Jätkäsaari Cold Water Swimmers group, which advocates for the winter swimming spot. The group's activities have attracted political support, with local politicians like Mari Holopainen initiating a city council proposal in their favor. Media coverage has helped raise awareness and support for their initiative. Promisingly, the city has made a preliminary decision to establish a winter swimming facility in Saukon Nokka within 5-6 years, and there are plans for other related developments in the area.

Inclusivity is a significant aspect of Katja's efforts. The group consists of diverse local residents, although many are reluctant to be visibly active. They have made efforts to include people from different linguistic and cultural backgrounds to demonstrate to the city that a diverse group of people are interested in winter swimming.

Katja suggests several improvements for the future. She emphasizes the need for safe and accessible facilities for everyone at the winter swimming site. She believes that participation should be more active and frequent than the current bi-annual OmaStadi voting process. Engaging marginalized groups directly, rather than relying solely on digital communication, is crucial. Continuous feedback and clear communication from the city about why certain proposals do not pass are also important. Katja acknowledges the need for experiences and facilities in the city, even if they are not permanent, to enhance community engagement and support.

3.9.3 Emilia Osmala, Participation Specialist at HSL

In an interview with Emilia Osmala, Participation Specialist at HSL, several key aspects of public involvement in decision-making processes related to public transport were discussed. Emilia Osmala's role focuses on integrating the public into these processes. Last year, HSL collected 200,000 feedback samples on various topics, including the HSL app and transport

routes. A notable example of public involvement was engaging marginalized groups to test the accessibility of the "pikaratikka" (fast tram).

Feedback is essential for planning and adjusting public transport services. It has influenced reviews of routes such as Kehä I and updates to Ylästö's services. However, HSL faces challenges with survey responses, often receiving too few or too many, mainly from women over 35 years old. Efforts are underway to diversify the respondent base.

Language barriers are recognized, and HSL sees the need for more language options beyond Finnish, Swedish, and English. Targeted projects have been implemented to gather actionable feedback from communities, such as the Somali community. Follow-up on feedback varies, with direct responses provided upon request, especially in customer service cases. High volumes of feedback are managed over time.

Public feedback significantly impacts planning and corrections, particularly concerning fare prices and route durations. A common concern among the public is the fairness of the zoning system. Youth involvement is also a focus, with projects like the one in Martinlaakso, where students from Laskivuori Lukio participated in surveys and interviews as part of their Geography course, integrating HSL feedback processes into their education.

In response to safety concerns on bus line 560 in Eastern Helsinki, measures such as installing safety glass for drivers have been implemented to address incidents of violence. HSL also reaches out to non-customers, such as car users in Martinlaakso, through emails, inviting them to discussions to better understand their preferences.

Participation in urban planning is on the rise in Helsinki, Vantaa, and Espoo, with a growing number of people showing interest in public transport planning. This increasing engagement is a positive trend for the future of urban development.

3.9.4 Eva Tawasoli, City Councilor of Vantaa

Eva Tawasoli, a city councilor of Vantaa, discusses her work focusing on democracy and civic engagement. She highlights that although Finland offers many opportunities for citizen participation, actual involvement in decision-making is low, which some researchers call the paradox of democracy. This paradox exists despite the system being designed to facilitate participation.

Tawasoli explains that people often don't vote or engage in decision-making processes, and she emphasizes the need for initiatives like citizen juries and participatory budgeting to enhance involvement. In Vantaa, participatory budgeting has been introduced, where citizens can propose ideas for budget allocation, though it requires further development.

The conversation addresses why immigrant communities may be less involved in the democratic process. Tawasoli notes that immigrants might distrust the system based on experiences from their home countries where corruption is rampant. Additionally, there's a lack of familiarity with the Finnish political system and a feeling that no political party or candidate represents their interests.

To improve engagement, Tawasoli suggests providing information in immigrants' native languages and fostering trust through continuous exposure to Finnish democratic processes. She shares her own experience as an immigrant from Iran, explaining that her trust in the system developed over time as she integrated into Finnish society and participated in local politics.

The discussion also explores the potential of using AI-driven chatbots to disseminate information about local decision-making in multiple languages. This tool could answer citizens' questions about municipal decisions, improving transparency and trust.

Tawasoli concludes by mentioning an example from Latin America, where participatory budgeting helped reduce corruption and increased citizens' trust in the political process by involving them directly in budgetary decisions and oversight. This increased transparency and mutual understanding between citizens and officials.

3.9.5 Emmia Keskiarja & Janne Teräsvirta, Architects

Emmi Keskiarja and Janne Teräsvirta are architects at e & j arkkitehdit oy. Emmi focuses on participatory urban planning, involving diverse stakeholders in the design process, while Janne specializes in public construction projects and broad user group engagement.

They employ open and structured workshops, including children and various community members, to gather input on urban planning. For example, the Luonnonmaa Visio 2070 project engaged participants from diverse backgrounds to create a vision for the future.

According to them, participation helps create better and more livable cities and fosters a sense of ownership among residents. Emmi emphasizes skillful management of the process to uncover true community desires, while Janne highlights the psychological benefits and necessity of genuine impact on outcomes. Dominance by authoritative figures in meetings and participants reverting to a classroom mentality are common challenges. Creative activities and hands-on engagement help mitigate these issues. Transparency and clear communication about how input is used are crucial. Designers should share new insights and outcomes influenced by participatory inputs.

Furthermore, citizen input can significantly alter project directions, as seen in market square planning in Jyväskylä and community-led design elements in Copenhagen. Engaging younger participants through creative activities like clay modeling workshops helps facilitate discussions and participation. However, they acknowledge the challenges in involving marginalized groups and emphasize the importance of language, familiarization, and using food as a unifying element.

In the end, both agree that social media, climate change demands, and behavioral data will shape future participatory urban planning. The distinction between data collection and genuine social interaction in participation is emphasized.

3.9.6 Kaisa Spiling, Forum Virium

Kaisa, a project developer at ForumVirium since 2010, discusses her work focusing on city innovation and citizen engagement in Helsinki. She highlights that while there are ample opportunities for citizen participation, getting meaningful involvement remains a challenge, especially in older districts. This paradox exists despite the efforts to create inclusive platforms for public input.

Kaisa explains that ForumVirium works on various projects to improve urban spaces by incorporating citizen feedback. In the Malmi district, for instance, the Alamalmmi Park renovation involved local residents in designing a climate-friendly and secure space, including customizable lighting solutions. These initiatives aim to enhance public engagement and ensure that developments meet community needs.

The conversation addresses the difficulties in engaging citizens, especially from marginalized groups. Kaisa notes that older residents may be less excited about changes, while immigrants might lack familiarity with the Finnish political system or feel underrepresented. Engaging

these communities requires tailored communication strategies, local networks, and incentives to foster participation.

To improve engagement, Kaisa suggests using digital tools and interactive methods, like AI-driven visual prompts for urban planning. She emphasizes the importance of making participation enjoyable and educational, using examples like pilot projects in various Helsinki districts that invite direct citizen involvement and feedback.

Kaisa also highlights the role of projects like CommuniCity and GreenCities, which focus on including diverse viewpoints. These projects collaborate with universities and use existing materials to reach out to different groups, ensuring a broad range of perspectives in urban development.

The discussion further explored future trends, such as using AI tools to enhance citizen engagement by providing visual and interactive feedback mechanisms. These innovations aim to make urban planning more inclusive and responsive to the needs of all residents, fostering a sense of community and shared ownership over city developments.

3.10 Design sprint at CERN

The design sprint at CERN lasted from Monday to Friday and took inspiration from Knapp et al (2016) book “Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days”.

We had as a team established our team’s code of conduct during the kick-off days and got accustomed to a process where roles and responsibilities would shift between different meetings.

Even though Knapp et al (2016, p. 30) recommend always assigning The Decider from the group who can make the final calls, we as a team had adapted to working without one, but rather using voting tools, when necessary, to form a decision.

Before the week at CERN, the team had completed the first phases of the sprint: data collection and expert interviews.

3.10.1 First sprint day: Data analysis and insights

There would not be full, uninterrupted working days reserved for the sprint, which meant from the beginning we needed to learn to adapt our process and iterate on our plans.

Monday the first task for the team was to establish our goal and plan for the week. We listed the sprint questions to our whiteboard iterating on what we had already been working on in the previous months.

Once the goal and plan were clear for the week, we embarked on the second topic of the day, which was to analyze the interview data and create insights. This was done by each team member at time going through their interview notes, while the rest of the team used post it notes to write down key insights and statements that came to their mind from the interviews. Once all the interviews had been processed, the next step was to place all the post its on the wall and start grouping them based on themes.

Clear themes were formed and after some discussion, the team started forming insights out of those to a separate board. These insights would later be a key element in our ideation work.

3.10.2 Second sprint day: Exploring ATTRACT technology

Before the sprint week, the team discussed and investigated the different ATTRACT technologies and how they could be applicable to participatory planning. It was, however, decided to leave further exploration for the actual sprint week.

First the team started with a simple “wake up” exercise, where the goal was to do simple ideation around the topic of how any technology in the world could be applicable to our topic. This was done in the form of brainwriting, which is a method where everyone is given a stack of post its, a pen and given 3 minutes to write out, in silence, any ideas related to the topic (Stickdorn et al. 2018, p. 180). Once 3 minutes were up, the ideas would be given to the person next to them and then another 3 minutes were given to further ideate on those. This way the team was able to build on top of each other’s ideas. The results were then placed on a wall and categorized. Different ideas using technologies came up, but the use of AI was the most prominent in all of them. This would later carry over to our other ideation.

The next exercise focused directly on ATTRACT technologies and used a variation of the brainwriting method called: Teleport Storming. This method offered a contextual shift to the team that would help us to challenge ourselves when trying to ideate and find ways of applying ATTRACT technologies to our solution.

First the team would review the information related to each of the five ATTRACT technologies: Hipmed, h-cube, MICROQUAD, Sniffidrone and Random Power. Next, for each of the technologies a different “teleporting scenario” was established. The team would get three minutes to ideate on post its ideas of how the technology could be used in an imaginary setting, for example, when being teleported to Mars settlement in the year 3000.



Picture 2: Teleport storming with ATTRACT technologies

The ideas were then posted on a whiteboard and reviewed together by the team. Two interesting ideas were highlighted:

- Hipmed: The camera could be used to detect people's true reactions by monitoring bodily reactions, for example changes in skin color or blood vessels.
- Random Power: A solution for secure voting process enabling online voting for users

One of the challenges for the team during the project and sprint week was how to best apply the ATTRACT technologies to the solution. The topic we had chosen was quite abstract and more of a societal issue. From the very beginning Random Power was considered to have the most potential for our topic, as with participation one challenge is how to process people's data and votes confidentially. For that, Random Power could be an option. Later during the sprint, the team made a conscious decision with support of CERN's Knowledge Liaison Officer, Pablo Garcia Tello, to not further research the use of Random Power with the solution. This would be something that could be focused on in later iterations if there was a need for strong encryption of personal data.

3.10.3 Third sprint day: Ideation

Before starting the actual ideation work, it is important to establish the user personas that will guide in the design work in search of the solution. The user persona is based on the collected research, and it helps to create an archetype of the group of people the solution will then be aimed for. (Stickdorn et al. 2018, p. 40.)

The team selected the group the solution would focus on based on the previous research and once this baseline was set, it was agreed that half of the team would start working on forming the actual user persona. The other half would meanwhile already start planning and designing the structure for the final presentation, as time was limited.



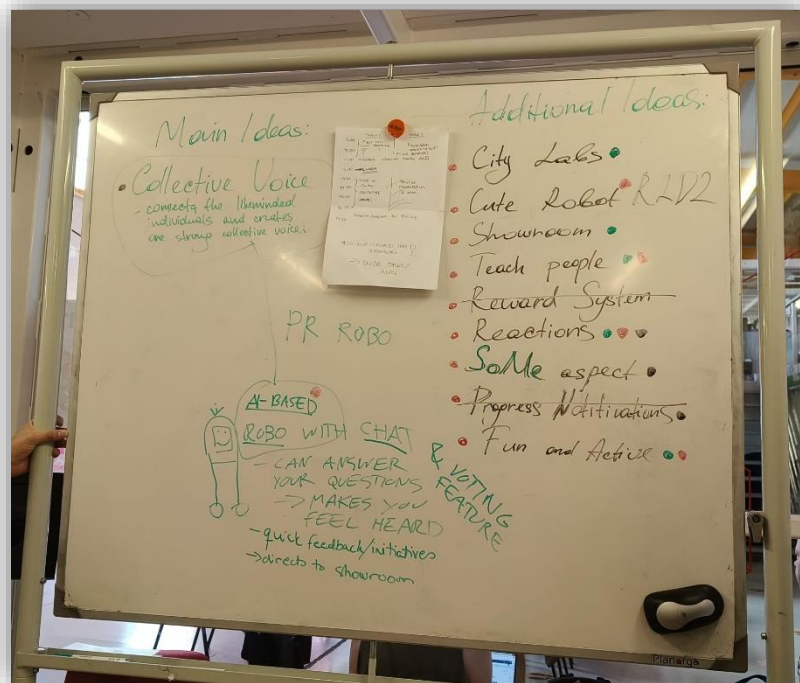
Picture 3: Visualization of the user persona

Half-way through the day the team would meet and review the progress together: first the user personas and then the presentation structure. After this, when we had our persona ready, the team was ready to move further with ideation work.

A modified "four sketch" approach was used to start ideation. Everyone was handed two A4 papers and given instructions to spend 15 minutes on writing down specs and information related to the topic. After that everyone, in their own workspaces, would spend the next 20 minutes writing and drawing on the other paper any ideas that would come to their mind.

Once this was done, the process was slightly modified, and the team already moved forward to the “art gallery” step where all the ideas were posted on a wall next to each other to create an idea wall. Everyone was handed out three yellow and two blue stickers. Yellow stickers would be used when wanting to highlight a specific part of the idea that was liked or interesting. Blue stickers were used to signal that the whole idea itself was considered good or interesting.

In groups of two, the stickers were silently being placed on the art gallery wall. Once all stickers were used the team came back together to review and analyze the results. With the stickers we were able to create a heatmap of the idea wall. The findings were listed on a separate whiteboard and slowly, but surely, an idea was starting to formalize. In the first iteration, different parts from multiple ideas were combined into one solution. After this was achieved, it was time to take a rest and get back to finalizing the idea the next morning, before prototyping would begin.



Picture 4: Result of the ideation work

3.10.4 Fourth sprint day: Prototyping

The fourth day started with a review of the previous day’s results and iteration of the ideation that had happened. It became clear that the solution the team had was out of scope and would have been challenging to prototype given the time constraints. The team decided unanimously to cut multiple parts of the solution away and in the end the solution that was left was constructed out of just two combined ideas.

There was alignment on the solution and the team was ready to move forward to the next phase: prototyping. Work was delegated, and part of the team would focus on building the actual prototype while the rest would work on finishing the presentation material. This divide worked well and ensured that the team was able to stay on schedule.

The prototype was tested in the local cafeteria by showing a video of the prototype and doing quick interviews. The test focused on the looks of the prototype: how people would feel if

that kind of robot would approach them, which adjectives would they use to describe the prototype and what would make it even more friendly looking and easy to approach.



Picture 5: The final prototype of Aili

3.10.5 Fifth sprint day: Shark Tank and final presentation

The final day started with Shark Tank where the team got a chance to present the prototype and pitch the solution to the teachers and CERN representative prior to the official, final presentation. Valuable feedback was received, and it was clear that the presentation still needed more work before showing it to a wider audience. The team had four hours to iterate based on the feedback given. Feedback was quickly distributed to action points that were then delegated to different team members to ensure efficiency.

One group focused on honing the presentation of the physical prototype, while another group started working on visualizing and simplifying the presentation material itself. The team came together an hour before the final presentation to go through the improvements and make final adjustments.

In the afternoon it was time for the final presentation, which took in all the learnings from the Shark Tank: the presentation was kept visual, clear and captivating from start to finish. The prototype was presented using “role playing” method to showcase the features and the value of the idea itself. Role play is a simple method where a key scene is selected that is then acted out using props (Service Design Tools, nd).

Once the presentation was concluded, there was a moment reserved for feedback and questions from the audience. The audience had good follow-up questions related to the solution’s scalability and technical implementation. Overall, feedback and reactions were positive.

3.11 Value Proposition

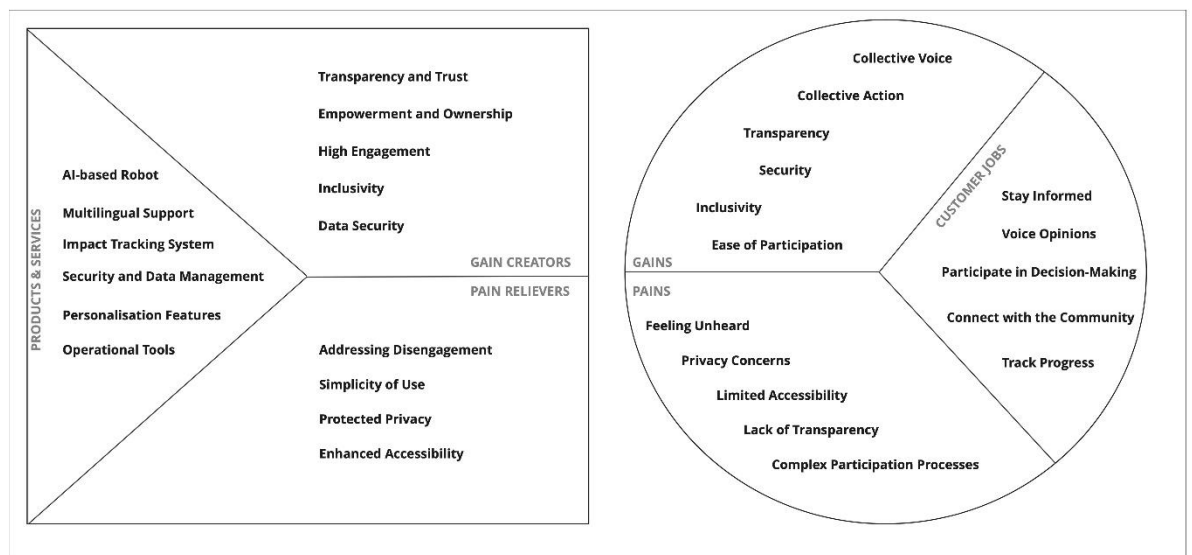
Urban planning has always been a complex and often opaque process, leading to a disconnect between decision-makers and the citizens they serve. Many individuals feel that their input

goes unnoticed and that their voices do not have the power to affect change. In response to this pressing issue, we came up with the concept of Aili, an innovative AI-based robot designed to bridge this gap and amplify the collective voice of citizens for improved urban planning and community involvement.

Aili's core value proposition lies in its ability to amplify the collective voice of citizens, ensuring every individual feels their input matters. By providing an accessible and user-friendly platform for feedback and participation, Aili bridges the gap between citizens and decision-makers, enhancing a sense of involvement and achievement among its users.

By fostering direct participation in urban planning and maintenance activities, we empower residents, enhance their sense of ownership, and build trust in local governance. Our comprehensive approach integrates preventive maintenance strategies, climate resilience initiatives, and sustainable urban development practices to create cities that are not only livable and sustainable but also thriving hubs of innovation and community engagement. This ensures that every citizen, regardless of socioeconomic status, has access to a safe, healthy, and vibrant living environment, contributing to the global effort to create more inclusive, resilient, and sustainable urban areas.

VALUE PROPOSITION CANVAS



Picture 6: Value Proposition Canvas

3.11.1 Customer Segments

Aili targets several key customer segments, each with distinct needs and challenges.

- **Active citizens:** individuals who are eager to contribute to their communities but lack the resources or knowledge to make a significant impact. They are often engaged but feel their voices are drowned out in the broader conversation.
- **Inexperienced participants:** These individuals may be intimidated by the complexity of the urban planning process or unsure of how to effectively communicate their ideas and translate feedback.
- **Disillusioned citizens:** who feel their efforts go unnoticed. They are frustrated by the lack of transparency in the decision-making process, leading to apathy and

disengagement.

- Citizen activist groups and organizations: these groups need effective ways to engage and gather support from the community, ensuring their efforts lead to measurable outcomes.

3.11.2 Customer Jobs

Aili addresses several key customer jobs. It facilitates engagement in urban planning by providing a platform for citizens to contribute ideas and feedback. It helps individuals and organizations build community support for local causes and initiatives. Aili also enhances transparency and trust by showing citizens how their input is used and the tangible results of their participation. Additionally, it helps citizens engage with like-minded individuals and form collective actions.

3.11.3 Gains

The introduction of Aili leads to significant gains for all customer segments. Increased participation is a primary benefit, as Aili makes it easy and appealing for citizens to engage in urban planning. The robot's approachable customizable design and user-friendly interface lower the barriers to participation, encouraging more individuals to get involved and participate in decision-making.

Empowerment and ownership are additional gains, as Aili allows citizens to track their suggestions and see tangible outcomes. This fosters a sense of empowerment and ownership over community projects, making individuals feel valued and heard. Furthermore, Aili helps build stronger community bonds by connecting like-minded individuals and enabling collective action. Moreover, encrypted connection provides confidence in the privacy and security of shared data.

3.11.4 Pains

Aili effectively addresses the pains experienced by its target customer segments. It mitigates the feeling of neglect by ensuring that citizen input is acknowledged and tracked. The complexity of participation is reduced through Aili's user-friendly interface and comprehensive support for multiple languages and sign language. Lastly, Aili helps combat the isolation felt by individuals in their efforts to influence community projects by providing a platform for collective action.

3.11.5 Products and Services

Aili, the AI-based robot designed to enhance citizen engagement in urban planning.

The Impact Tracking System allows citizens to see how their feedback influences decisions, providing a clear link between their input and tangible outcomes. By enhancing transparency and building trust, the Impact Tracking System ensures that citizens feel valued and heard.

Aili's design emphasizes personalization and accessibility. The robot supports multiple languages, including sign language, ensuring inclusivity for all citizens. Its avatars and interface can be customized to reflect community diversity and specific causes, making interactions more engaging and relatable. This level of personalization promotes a sense of empowerment and ownership among citizens, transforming individual frustrations into collective action and influence.

Aili's operational and interactive features are designed to maximize citizen engagement. The robot operates based on GPS data, ensuring it is present where citizen activity is highest, for example. It offers tools for petitions, polls, and anonymous voting, making it easy for citizens to participate in various initiatives. Real-time communication capabilities, including voice and text in multiple languages, enhance user engagement and ensure Aili can effectively interact with a diverse population.

Security and data management are paramount for Aili. The robot employs robust security measures to protect user data and ensure privacy. AI-driven evaluation of content prevents misuse, while secure data processing ensures feedback is effectively relayed to decision-makers. This meticulous approach to data management builds trust and ensures that citizens feel confident in using Aili.

3.11.6 Gain Creators

The following features of our AI-based robot act as gain creators for our solution. The Impact Tracking System enhances transparency, showing citizens how their feedback influences decisions. Personalized interactions foster a sense of ownership and collective action. Real-time communication and interactive tools ensure high levels of citizen participation. Support for multiple languages and customizable interfaces ensure that all citizens can engage effectively. Strong security measures build trust and confidence in the system and data collection.

3.11.7 Pain Relievers

By providing a clear link between feedback and outcomes, Aili mitigates the feeling that citizen input doesn't matter and successfully reduces citizen disengagement. Our robot simplifies the participation process with user-friendly interfaces and multiple interaction modes, dependent on the project, organization, cause, end-user, etc. Multilingual and sign language support make it easy for diverse user groups to participate.

Aili represents a culturally sensitive and technologically advanced approach to urban planning and community engagement. By amplifying the collective voice of citizens and ensuring that everyone can be heard, Aili fosters a sense of involvement, empowerment, and community. Its innovative features and comprehensive support for personalization and accessibility make it a valuable tool for enhancing citizen participation and building stronger, more inclusive communities.

4 Final Solution

Our solution, an AI-based robot named Aili, aims to enhance citizen participation in urban planning by addressing the widespread apathy and disengagement among the general populace. Initially, our vision was centered on the concept of City 2.0, which sought to integrate the best aspects of rural and urban living for an improved quality of life. However, through a series of ideation exercises and prototyping sessions, we identified a more pressing challenge: the lack of citizen involvement in urban planning processes. This realization led us to focus on creating a targeted solution that motivates and increases citizen participation.

The core challenge we identified is the pervasive "I don't really care" attitude among citizens regarding urban planning. Many individuals feel their voices are unheard and their input insignificant, leading to low engagement levels in community decision-making. This disengagement hampers the development of urban areas that truly reflect the needs and desires of their residents.

4.1 Primary Stakeholders

The primary stakeholders in urban development encompass citizens, municipal governments, community organizations, and businesses and investors. Citizens who inhabit urban areas have valuable opinions and ideas regarding their surroundings but often lack the means or platform to effectively express them. Municipal governments, including city councils and urban planners, are responsible for making decisions that shape urban development. Community organizations advocate for the needs of the community and strive to influence urban planning to ensure that residents' voices are heard and considered. Meanwhile, businesses and investors are keen on sustainable urban development that attracts residents and stimulates economic growth, contributing to the overall vitality and prosperity of urban areas. Citizens: Individuals who live in urban areas and have opinions and ideas about their surroundings but lack the means or platform to express them effectively.

4.2 User Pain Points and Needs

- Lack of Platform: Citizens often lack a straightforward platform to voice their concerns and suggestions.
- Feeling of Insignificance: Many individuals feel their input does not matter and does not influence decisions, hence the demotivation to participate in any initiatives.
- Complexity and Accessibility: Urban planning processes can be complex and inaccessible to the general public, deterring participation.

Pain Relievers:

- Impact Tracking System: Aili provides a transparent system where citizens can see how their feedback influences decisions, thus validating their contributions.
- Personalization and Accessibility: The robot supports multiple languages, including sign language, and offers customizable avatars and interfaces to reflect community diversity.
- Ease of Use: Aili simplifies the participation process with tools for petitions, polls, and anonymous voting, making it easy for citizens to engage.
- Empowerment: By providing a platform for meaningful participation, Aili empowers citizens to influence their urban environment actively.
- Community Engagement: Aili fosters a sense of ownership and responsibility among residents, encouraging them to take part in maintaining and enhancing their surroundings.
- Sustainability: The solution integrates sustainable practices, such as promoting green spaces and renewable energy, ensuring long-term livability and resilience of urban areas.

4.3 Solution Elements Description

Aili's design incorporates several advanced technologies to create an interactive and user-friendly experience for citizens. As mentioned earlier in the report, we have considered possible applications of ATTRACT technologies for this project. The most applicable of them in our case was Random Power. However, having our challenge revolve around societal issues and after a consultation with CERN's Knowledge Liaison Officer, Pablo Garcia Tello, we decided to not further research the use of Random Power for our solution. This would be something that could be ideated upon in the future, as there is a need for strong encryption of personal data.

The Impact Tracking System allows citizens to track the progress and impact of their feedback in real-time. It links user suggestions to tangible outcomes, enhancing transparency and building trust. For example, if a citizen suggests the need for more bike lanes, the system acknowledges the suggestion and provides a link to track its status. Users receive updates on the review process, decision-making, and implementation stages. Aili also supports multiple languages via LLM, including sign language, and offers customizable avatars and interfaces that reflect community diversity. This feature ensures that all citizens, regardless of their background or abilities, can engage with the robot. Personalization fosters a sense of belonging and encourages active participation.

Our robot operates based on GPS data, ensuring it is present in areas with high citizen activity. It facilitates petitions, polls, and anonymous voting, making engagement straightforward and effective. Aili can be deployed in public spaces such as malls, parks, and community centers, where it interacts with citizens, collects feedback, and relays it to decision-makers. At the same time strong security measures are in place to protect user data and ensure privacy. AI-driven evaluation of content prevents misuse, while secure data processing ensures feedback is relayed accurately. Data collected by Aili is processed by dedicated teams to create actionable insights for urban planners. Security protocols ensure user information remains confidential and protected.

4.4 Prototype

To illustrate how Aili functions, we have developed a prototype that demonstrates the user interface and interaction flow.

The LCD touch screen displays options for submitting feedback, viewing project status, and participating in polls. Users can type, dictate voice messages, or use sign language to interact with Aili. The physical keyboard appears in case the user needs to type in the message. A voting box appears for secluded secure voting in public areas.

4.5 Use Case Description

Scenario: A resident in a downtown area suggests the need for more green spaces.

Interaction: The resident interacts with Aili at a community center, providing feedback via voice message.

Process: Aili acknowledges the suggestion, records the feedback, sends it to the authority/organization that leased or rented Aili, and provides a link to track its status.

Outcome: The resident receives regular updates on the review process, decision-making, and implementation. Aili continues the search for potential initiative supporters and helps move the process further. Once the suggestion is approved, Aili provides detailed project timelines and impact reports, showing how the feedback influenced the decision.

4.6 Potential Commercial Applications

Aili's innovative approach to citizen engagement offers numerous commercial applications:

Cities can deploy Aili to gather community input on urban planning projects, leading to more inclusive and well-informed decisions. This would raise citizen satisfaction and improve urban development outcomes, translating a collective voice into action.

Real Estate Developers can use Aili to engage local communities, ensuring that new projects align with the needs and desires of residents. This would increase community support and smoother project approvals.

Aili can be used at public events to collect feedback and engage attendees in local issues, providing valuable insights for future planning. The robot could be rented for specific events, for example, to gather more precise data on local issues. This would increase community involvement.

Non-Profit Organizations can use Aili to mobilize support for various causes, gather signatures for petitions, and raise awareness about important issues. This would promote enhanced advocacy efforts and greater community impact.

4.7 Societal Impact

Aili's implementation can lead to significant societal benefits:

By making the feedback process transparent and accessible, Aili encourages more citizens to participate in urban planning. This leads to decisions that better reflect community needs and desires in a more transparent way. Personalized interactions and the ability to see the impact of their feedback empower citizens, transforming individual frustrations into collective action and influence. Aili fosters a sense of community and belonging by connecting like-minded individuals and facilitating collective initiatives. This strengthens the social fabric of urban areas.

Integrating sustainable practices, such as promoting green spaces and investing in renewable energy, ensures that cities remain livable and resilient in the face of climate change. Sustainable urban development enhances the overall well-being of residents and attracts businesses, creating economic opportunities.

Aili's support for multiple languages and its customizable interface ensures that all citizens, regardless of their background or abilities, can participate in urban planning. This leads to more inclusive and equitable urban development. The Impact Tracking System enhances transparency, showing citizens how their feedback influences decisions. This builds trust between the community and decision-makers, fostering a more collaborative and cooperative approach to urban planning.

Aili, our AI-based robot, represents a groundbreaking solution to the challenge of low citizen engagement in urban planning. By providing a transparent, personalized, and accessible platform for community feedback, Aili empowers citizens to influence their urban environment actively. The robot's innovative features, including the Impact Tracking System, multilingual support, and robust security measures, ensure that all voices are heard and valued. The societal impact of Aili is profound, fostering increased citizen participation, empowerment, community engagement, and sustainable urban development. The potential commercial applications, ranging from municipal governments to non-profit organizations, highlight the versatility and value of this solution.

Ultimately, Aili contributes to the global effort to create more inclusive, resilient, and sustainable urban areas. By prioritizing citizen engagement and sustainability, Aili transforms cities into vibrant communities where innovation thrives, cultures blend, and residents enjoy a high quality of life. This comprehensive approach aligns with the objectives of SDG 11, advancing the goal of making cities inclusive, safe, resilient, and sustainable.

5 Conclusion and Reflection

In the beginning of the process, we familiarized ourselves with Sustainable Development Goal 11 (SDG 11), which aims to make cities and human settlements inclusive, safe, resilient, and sustainable. This goal encompasses a variety of challenges, including housing affordability,

efficient public transportation, urban sprawl, pollution, and disaster risk reduction. We quickly realized the breadth and diversity of this topic. On one hand, it was challenging to form a comprehensive understanding of the entire subject, and on the other hand, we needed to delve deeply into specific perspectives. However, we managed to narrow down our focus to one crucial aspect within the overall theme: participation.

5.1 Participation in Focus

While participation might not seem like the most pressing issue at first glance, we realized during the research phase that it is a crucial component of achieving SDG 11. Without active citizen participation, urban planning and development initiatives risk being disconnected from the real needs and desires of the people they aim to serve. Participation fosters a sense of belonging and ownership among citizens, ensuring that their voices are heard and considered in decision-making processes. This inclusive approach not only helps to address specific urban challenges more effectively but also builds stronger, more cohesive communities. Therefore, meaningful participation is essential for the successful realization of SDG 11, as it empowers citizens and ensures that urban development is truly sustainable and reflective of the collective aspirations of the community.

5.2 The Process

The design process for addressing SDG 11, aiming to enhance urban living and participation, began with initial exploratory sessions where team members shared their interests related to sustainable urban development. This collaborative phase involved forming groups and utilizing tools like Miro boards to compile research, laying the groundwork for a deeper understanding of the challenges and opportunities within SDG 11.

The original intent was to conceptualize 'City 2.0,' a hybrid urban space blending rural tranquility with urban efficiency, aimed at improving quality of life through sustainable practices. However, recognizing the enormity of this task, the focus narrowed to increasing public engagement in urban planning, particularly targeting the prevalent indifference towards such initiatives among the general populace.

Identifying the target group as individuals with the desire but lacking the means to influence their urban environments, the team pivoted to enhancing civic engagement. The approach centered on empowering residents to feel a sense of ownership and responsibility towards their city's development. This involved integrating service design methodologies and human-centered design principles to ensure the solutions were responsive to community needs. Key strategies included fostering direct participation in urban maintenance, enhancing climate resilience, and promoting sustainable urban practices.

Through iterative design processes and inclusive participation, the goal was to give citizens the means to have an impact in their own urban environments and promote a sense of community. The integration of AI tools was proposed to facilitate interaction, ensuring that all voices, particularly those typically marginalized, were heard and valued in the planning process.

Trust the process became the motto of the development work. The design process and the development work towards the final solution were not always easy and straightforward. At times, we found ourselves revisiting the same discussions and going in circles. However, we decided to trust the process and design tools, which allowed us to make progress in our development work. As a result, we achieved an excellent solution to the development challenge we had chosen.

5.3 Interviews

In interviews with experts, key challenges in promoting inclusion and participation in urban planning were discussed, including engaging diverse opinions, especially from ethnic minorities and marginalized groups, due to financial, political, and social barriers. Despite these challenges, successful strategies have involved direct community engagement, multidisciplinary interventions, and inclusive funding. Activists have faced hurdles in motivating community participation and bureaucratic obstacles.

Successes have been achieved with political support and media coverage, underscoring the need for clear communication and accessible facilities. The importance of public feedback in transportation planning is highlighted, despite difficulties in diversifying respondent demographics and overcoming language barriers. The low actual involvement in participatory systems suggests that initiatives like citizen juries and participatory budgeting could boost engagement, particularly among immigrant communities. Participatory urban planning is praised for creating livable cities and fostering ownership among residents, using creative and transparent methods to involve diverse stakeholders. Challenges in engaging older and immigrant residents emphasize the need for digital tools and interactive methods to make participation enjoyable and educational. The integration of emerging technologies and interdisciplinary approaches is crucial for fostering inclusive and sustainable urban development.

We managed to find excellent experts to interview in Finland. They confirmed the insights and ideas we had found in our research, but they also were able to offer new perspectives and give concrete examples of real-life situations. The prior contacts our team members had in Finland proved to be very valuable, as most of interviewees were found through them.

5.4 Our solution

The ideation phase produced originally an extensive and multi-part concept for the final solution. It was crucial that we narrowed down the final solution and chose only one part of the whole concept to be prototyped. The prototype we named Aili.

Aili is an AI-powered robot designed to address the participation challenges within Sustainable Development Goal 11 (SDG 11), which aims to create inclusive, safe, resilient, and sustainable cities. Recognizing the difficulties in engaging a diverse range of citizen opinions, particularly from marginalized groups, Aili provides an innovative solution to foster active participation in urban planning. Equipped with multilingual and multimodal capabilities, Aili allows citizens to submit feedback through text, voice, and sign language, ensuring accessibility for all.

Aili operates in public spaces, using GPS data to position itself where people are most active. Its customizable avatars and LCD touch screens make interactions engaging and relatable. By facilitating real-time updates on the impact of citizen suggestions, Aili builds a sense of belonging and ownership among participants. The robot's ability to provide follow-up information and generate impact reports demonstrates a transparent and responsive planning process, essential for gaining public trust.

Through direct engagement, inclusive funding strategies, and the integration of emerging technologies, Aili addresses financial, political, and social barriers to participation. By involving underrepresented communities and ensuring their diverse viewpoints are reflected in planning outcomes, Aili promotes more inclusive and sustainable urban development, effectively contributing to the realization of SDG 11.

5.5 Teamwork

The service design process, including an intensive design sprint at CERN, was a great learning process for the whole team. Our team, IncluCity, consisted of people representing different disciplines, personalities, skills, and strengths. We were able to combine our differences into a well-functioning multidisciplinary team.

During the process, a group of people who didn't know each other from before became a team working towards a shared goal. We got to know each other, became friends, and learned to work as a team. There were moments of frustration and tiredness, but we succeeded in creating a safe environment for all to express their feelings and opinions. In addition to the learning and finding a solution to our challenge, this may be the greatest achievement in the process for the team IncluCity.



Picture 7: Team IncluCity

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