

# The UrbanTestbeds.JR Playbook

Engaging Young Citizens to build  
a sustainable Urban Future

**Interreg**  
Baltic Sea Region

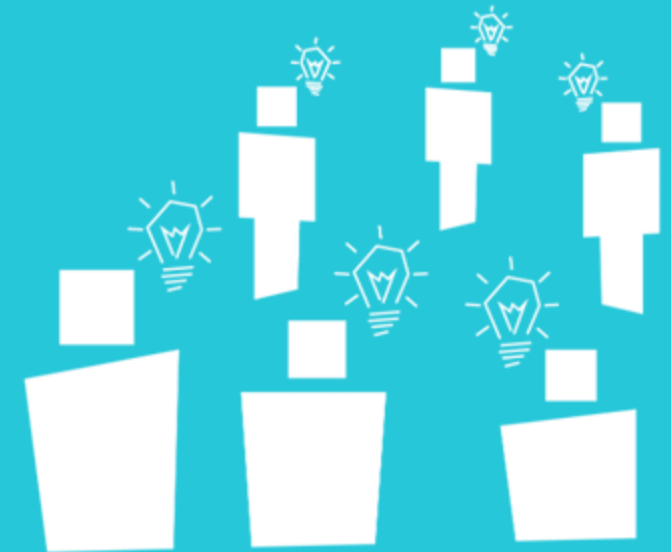


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RESILIENT ECONOMIES AND COMMUNITIES

**UrbanTestbeds.JR**



# Imprint

Aarhus University, Denmark

HafenCity Universität Hamburg, Germany

Luleå University of Technology, Sweden

with contributions from Vidzeme University of Applied Sciences, Latvia

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**HCU** | HafenCity Universität  
Hamburg



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Hamburg



***It's not just about asking children what they want to do, but understanding their dreams and the places they love or avoid.***

Lisbeth Mærkedahl, Aarhus, Denmark

***Urban experimentation turns cities into laboratories, empowering young citizens to co-create their urban futures. Engaging with young citizens regarding digital neighbourhoods, urban data and ideation, one should never underestimate the capabilities of the children.***

Kay Hartkopf, Hamburg, Germany

***UrbanTestbeds.JR is about building capacity for young citizens' engagement in urban futures scenarios and sparking meaningful conversations with the support of artificial intelligence, urban data and urban ideation.***

Jens Bley, Hamburg, Germany

***AI should be an enabler, not a replacement - keeping the human role central in every process.***

Abdolrasoul Habibipour, Luleå, Sweden

***Creativity transforms data from abstract numbers into meaningful, local stories that foster ownership and engagement.***

Marianne Ping Huang, Aarhus, Denmark

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# Introduction

# Introduction

Key Findings,  
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# Introduction – UrbanTestbeds.JR

UrbanTestbeds.JR encourages experimentation as a significant means to build resilient communities. The project focused on the co-design of urban testbeds for tangible experiences in sustainability and climate mitigation action with and for young citizens. The aim was to strengthen the joint participatory capacity for young citizens, local public authorities, higher research institutions and enabling interest groups. Participatory capacity was seen as a prerequisite for inclusivity in resilient communities, enabling young citizens to respond to climate and sustainability challenges. Experimentation included urban testbed experimentation, service experimentation, and experimental governance.

The capacity building had three components:

1. Artificial Intelligence-supported understanding and deconstructing of climate plans and their transformational goals/paths relevant for local experimentation.
2. Scoping tangible urban experimentation in testbeds.
3. Storytelling the impact and perspective of the experimentation by means of data-based storytelling.

Local authorities and interest groups in Germany, Denmark, and Sweden liaised with higher research institutions partners. The outcome is this “Playbook - UrbanTestbeds.JR” with chapters on urban experimentation as a context, young citizens engagement, artificial intelligence solution module to support the understanding and deconstruction of climate and sustainability plans as well as urban ideation.

HafenCity University Hamburg  
Aarhus University  
Luleå University of Technology  
Vidzeme University of Applied Sciences

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Aarhus Municipality  
Luleå Municipality  
Valmiera Municipality

Children's Museum Hamburg  
Code for Hamburg  
ARIC Artificial Intelligence Center Hamburg  
Central Library Hamburg  
Coding Pirates Denmark  
DOKK1 Central Library Aarhus  
Teknikens Hus (Science Center) Luleå  
AI Sweden

**#Young Citizens Engagement**  
**#Urban Experimentation**  
**#Artificial Intelligence**  
**#Storytelling**

# UrbanTestbeds.JR – Context & Challenge

The EU Green Deal emphasises the need for climate mitigation and adaptation to keep cities liveable in the future while communities are facing the challenge of responding rapidly to climate change. Experimentation, co-designing urban testbeds with tangible experiences for climate mitigation and sustainability, build the capacity to respond swiftly and become resilient communities. However, these future narratives had not extensively involved the youngest generations, who are most affected by these radical changes. Young citizens' involvement in decision-making is crucial for achieving sustainable transformation in the built environment and needs to be anchored in future governance models for wider citizen engagement.

The UN Convention on the Rights of the Child emphasises the right for young people to express their views, which must be considered. The Revised European Charter on the Participation of Young People in Local and Regional Life stated that young people's participation in local and regional life must be part of a global policy of citizens' participation in public life.

The German Federal Constitutional Court ruled in 2021 that the burden of climate change and its impacts could not be pushed onto future generations. Hamburg law also requires children and youth to be engaged in decision-making. However, public administrations still lack the perspective, tools, and methods to collaborate successfully with young citizens on a continuous basis, while young citizens lack avenues and tangible opportunities to engage in urban planning, design, and development. UrbanTestbeds.JR provides an approach to close this gap, contributing to the Baltic Sea region's encouragement of experimentation and finding solutions to increase the region's innovativeness.

The capacity of co-designing urban testbeds for sustainability and climate mitigation action with young citizens contributes to the advancement and inclusiveness of land-based spatial planning at regional and local level. Spatial planning is defined in the policy area as the coordination of practices and policies affecting spatial organizations. UrbanTestbeds.JR contributes to the advancement of practices especially in regard to the inclusion of young citizens and artificial intelligence supported co-design and data-driven (evidence based) storytelling. The combination of the different local municipal settings as context, permits a broad replicability and therefore might impact on a macro level.

UrbanTestbeds.JR also links to the Policy Area Innovation, aiming at supporting science and increased innovation capacity. UrbanTestbeds.JR is an innovation capacity building solution project with multiple target groups, including higher education and research institutions at the core of urban testbed experimentation. Therefore, the project also connects with the Policy Area Education.

# UrbanTestbeds.JR - Partnership

The project partnership consisted of partners and associated organisations from the Baltic Sea Region countries: Germany, Denmark, Sweden and Latvia. The partners included three higher research institutions in Hamburg, Aarhus, and Luleå, which were experienced in coordinating testbed and service experimentation with public and civic stakeholders, co-designing urban data-driven experimentation, and replicating processes across their local environments and interregionally. The associated organisations were public authorities and interest groups in the domains of young citizens engagement, open urban data and artificial intelligence.

UrbanTestbeds.JR deliberately chose higher research institutions as coordinators of the project and activities, as they are developers and drivers of urban experimentation and engagement processes with local public and civic stakeholders. This approach permits the replication of the project's solutions in other cities, regions, and countries with local higher research institutions as drivers and target groups.

Lead partner was HafenCity University Hamburg (HCU), Germany, which has deep experience in urban experimentation, urban testbeds, experimental governance, interdisciplinary metropolitan studies, and urban data developments. HCU collaborated closely with the municipality and civic organisations Children's Museum Hamburg, "Code for Hamburg" and ARIC - Artificial Intelligence Center Hamburg.

Aarhus University (AU) with its "Centre for Digital Transformation in Cities and Communities" interfaced with the Aarhus municipality and the non-profit organisation "Coding Pirates," and in the progress of the project with the central library DOKK1 with its extensive experience in young citizens engagement.

Luleå University of Technology (LTU) joined with extensive knowledge in living labs methodology and operations and interfaced with the Science Center Teknikens Hus and Luleå local authorities.

Vidzeme University of Applied Sciences in Valmiera, Latvia, focused on communicative aspects of the project with students as part of the curriculum and liaised with Valmiera municipality.



# Focus on Stakeholder & Local Citizen Engagement by Category

The aim of UrbanTestbeds.JR was to strengthen the joint participatory capacity for young citizens, local public authorities, higher research institutions and enabling interest groups, engaging stakeholders and local decision makers. Besides the engagement of young citizens, it became an integral part of the co-creation as engagement approach.

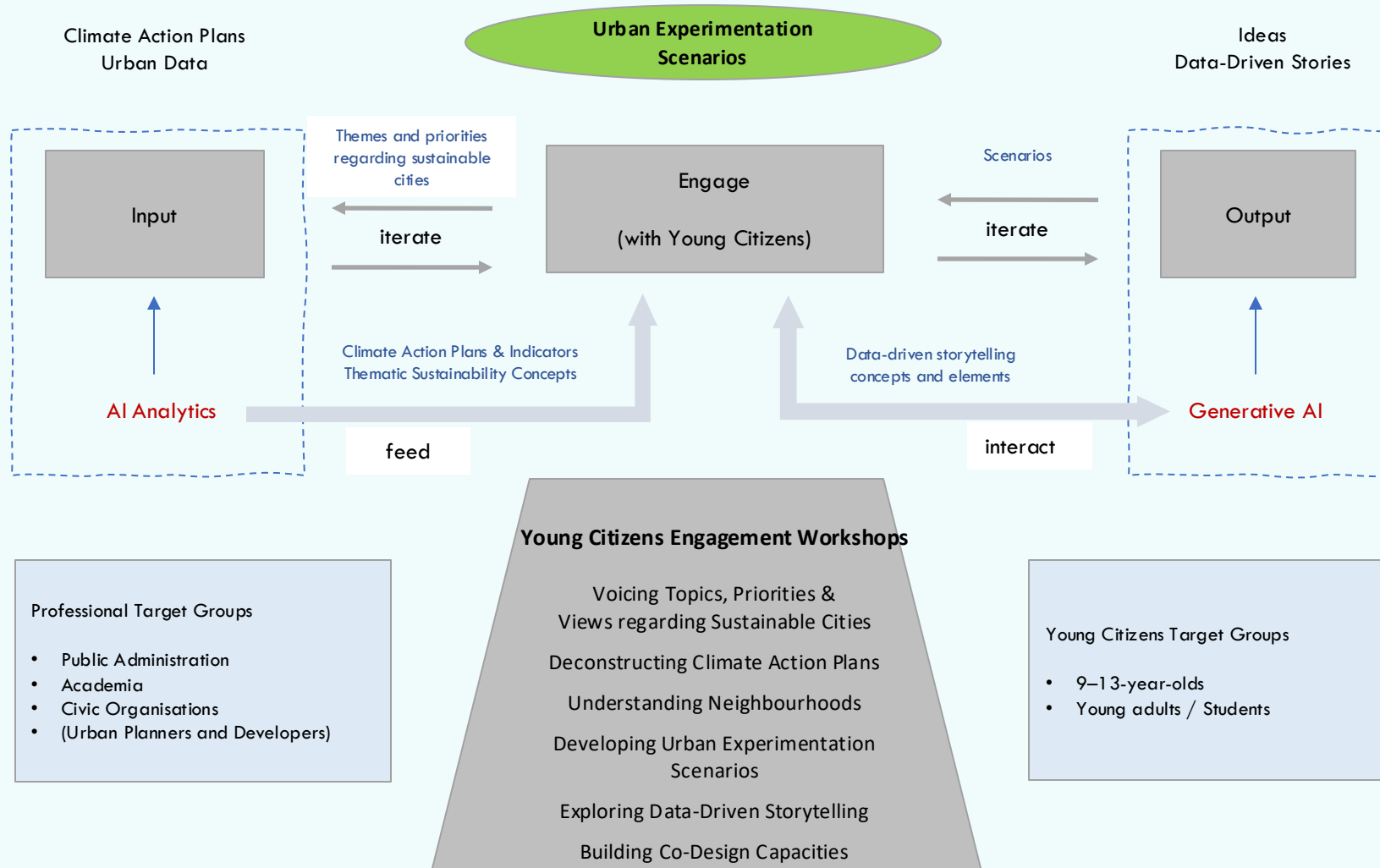
The main reasons for the recurrent stakeholder involvement has been to create learning communities across various stakeholders and the young citizens, because

- addressing climate challenges is to engage in wicked, wild, or complex problems which can only be done through multiple actor-groups and partnerships
- engaging different stakeholders as well as local authorities allows for non-linear innovation, which goes beyond technical or corporate solutions towards local social innovation
- local everyday knowledge and practices – ‘thick data’ - add quality to strategies and forecasted solutions, and lever public decisions to go beyond evidence- and data-based decision making
- last, but not least when stakeholder-groups experience the same engagement principles as the young citizens, the young citizens’ capacity for decision making becomes validated, which may become an impact pathway for solutions and recommendations made by children and youth



# Urban Planning & Urban Experimentation  
# Capacity Building  
# Multi Stakeholder Engagement

# UrbanTestbeds.JR – Conceptual Model



## From data gathering to urban futures creation

Our project followed a three-pronged approach.

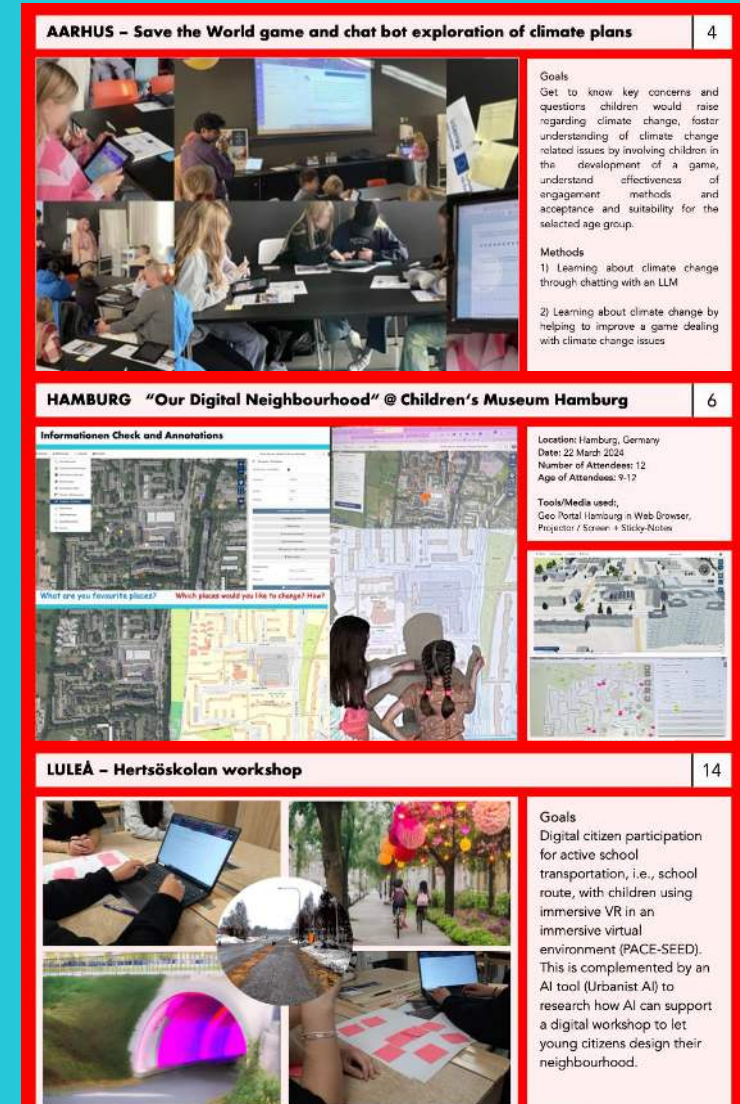
1. Inject information about climate change, its causes and impact into the co-creation process to equip our target groups with domain and neighbourhood specific knowledge supported by AI analytics.
2. Let the young citizens analyse and synthesise the information provided to induce critical thinking about the current state of the urban environment.
3. Let young citizens create scenarios and mitigation strategies supported by generative AI.

The initial step, information gathering and absorption, as well as the second and third step, scenario-building and urban futures generation went through several iterations to integrate the knowledge and insights gathered into coherent and impactful scenarios and actions to build a sustainable urban future.



# Our Key Findings

- Engage stakeholders in an iterative process in parallel to or mirroring the co-creation process with young citizens – the example of this is the process developed with DOKK1 in Aarhus in which stakeholders and local authorities went through the same co-creation design as the young citizens
- Develop an early, shared game plan with build-in iterations of e.g. scenario building for rapid prototyping within and across urban testbeds
- Take into consideration the rapid developments in the space of Generative AI which impacted the onboarding of technologies throughout the project, creating its own stream of rapid prototyping of engagement formats – from a ‘homegrown’ chatbot on local climate strategies to the implementation of UrbanistAI for urban ideation
- Discuss ethical considerations from project-start, ethics were discussed throughout the project, also on request of the stakeholders, many of which work on daily terms with children and youth
- Do not underestimate the capabilities of children and young citizens in terms of utilizing technology and AI applied to a real-world problem and their awareness of everyday issues and potential solutions to those -> so do not be shy to tackle “wicked” problems with them.



# Conclusions and Recommendations

- Develop a sequence of workshops with the same young citizens – not single events
- Find cultural / neighbourhood (co)-facilitators (library, museum, interest group) that ideally have an existing school or young citizens engagement programme.
- Prepare the facilitators in knowledge workshops and bootcamps
- Explain context of urban planning and urban experimentation – setting the goals for scenario building and urban ideation
- Walk the locations – take photographs, make drawings, generate ideas
- Base urban ideation on observations made by walking the locations
- Digital Neighbourhood / Urban Data – take time with stakeholders and young citizens to make sense of data and annotation
- Frame co-creation through Storytelling Exercises for potential exhibitions of results from the workshops
- Have observers from interest groups and municipalities join the events for capacity building
- Observe and document workshops and capacity building events

## ➤ Facilitators

HafenCity University	Aarhus
University	Luleå
University of Technology	

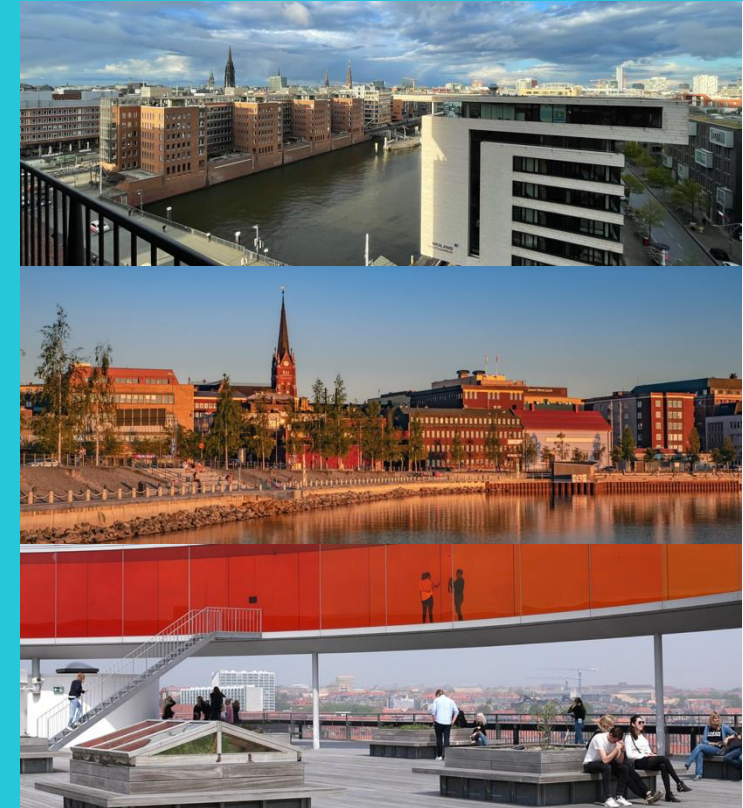
## ➤ Co-Facilitators:

Children's Museum Hamburg	DOKK 1
Library Aarhus & IRISLab	Luleå
Science Center (Teknikens Hus)	
Central Library Hamburg	ARIC AI
Center Hamburg	

# Urban Planning & Urban Experimentation  
# Neighbourhood Walks  
# Digital Neighbourhoods & Urban Data  
# Urban Ideation – AI supported visualization  
# Storytelling  
# Showcasing

# Transnational Learnings/Perspectives

- Engaging with local climate action plans is equally feasible in the different communities. They are digitally available and can be utilised, deconstructed and engaged with in AI chat formats as exercised by UrbanTestbeds.JR.
- AI-supported Urban Ideation as a method is feasible and can be similarly applied in different communities.
- Cultural institutions in the local communities can vary in their typology but can serve as strong facilitators of young citizens engagement.
- Urban data availability for evidence-based understanding, digital annotation and scenario building varied significantly between the partner communities. Whilst Hamburg has a very elaborate urban data portal that is accessible to everyone, the other communities have pockets of urban data with limited public access. This makes it harder for facilitators to organise digital neighbourhood engagement workshops and processes.
- The level of young citizens engagement expertise and approaches differs in the participating communities. Ad hoc engagements are common practice, but systematic competency building is not. Key is to include the local owners of the participation processes.

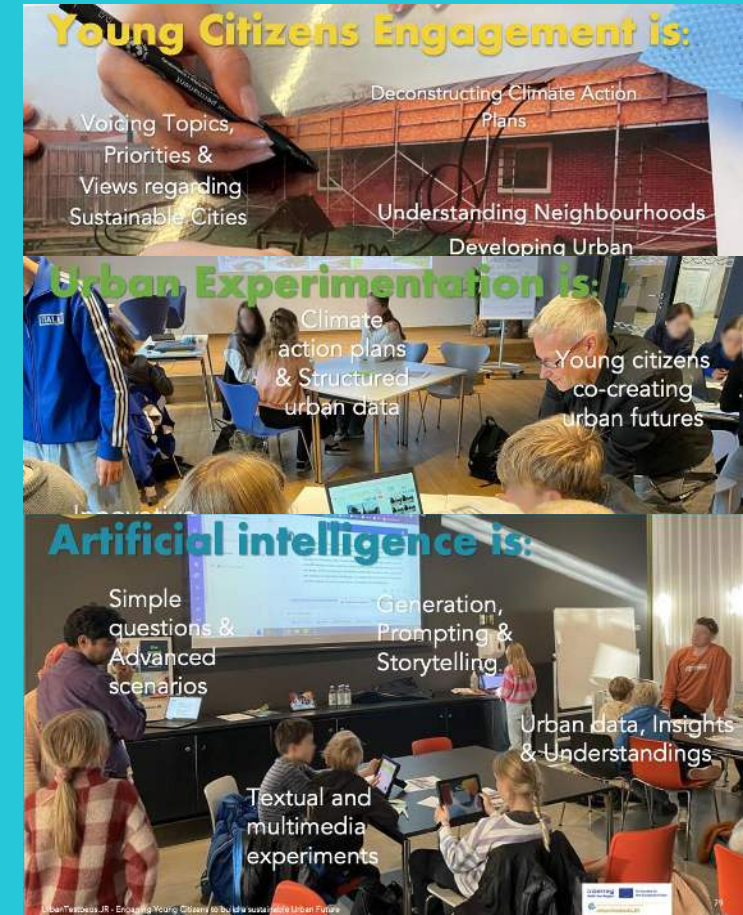


# AI supported Urban Ideation  
# AI enabled Urban Data Exploration  
# Young Citizen Engagement  
# Multi Stakeholder Engagement  
# Capacity Building



# Beyond the Project

- Hamburg: cooperation with the Ministry of Culture, Central Library, Children's Museum Hamburg and other stakeholders to transfer the co-creational young citizens engagement competencies, especially regarding urban ideation and urban data neighbourhood annotation. The UrbanTestbeds.JR learnings and playbook will become part of the City of Hamburg training series for young citizens engagement.
- Aarhus: DOKK1/IrisLab, Central Library, plans to roll-out further workshops in urban ideation as a method of co-creational engagements with young citizens in future city scenarios.
- Luleå: Luleå University of Technology has licensed the urban ideation software and service for the architectural/city planning department. The department is continuously engaged with Luleå Municipality and local schools in co-creational planning exercises.
- Baltic Sea Region: The UrbanTestbeds.JR Playbook will be publicly available through the partners and associate partners but also distributed to networks such as VASAB and the Union of Baltic Cities
- Beyond the Baltic Sea Region: The playbook will be shared with networks that have already invited UrbanTestbeds.JR to their conferences and exchanges.



# Multi Stakeholder Engagement  
# Playbook and Knowledge Sharing  
# Capacity Building

# Capacity Building

A decorative graphic consisting of a series of white dots. It starts as a horizontal line on the left, then turns 90 degrees upwards to form a vertical line, and finally turns 90 degrees to the right to continue as a horizontal line across the top right portion of the slide.



# Capacity Building

Bootcamps, workshops &  
Open Forums

Learnings from Stakeholder  
Engagements

Local Public Authorities.  
Interest Groups & Higher  
Education and Research  
Institutions

# Capacity Building – Introduction

The capacity-building efforts in UrbanTestbeds.JR were designed to empower local public authorities, higher research institutions, and interest groups to engage young citizens in urban experimentation in neighbourhoods, addressing sustainability and climate mitigation challenges.

The project methodology focused on knowledge workshops and bootcamps to prepare the target groups for young citizens engagements and have them participate in the young citizens engagement workshops as facilitators, observers or reflectors.

The knowledge workshops introduced best practices from Aarhus, Hamburg and Luleå in regard to young citizens engagement and provided insights into current artificial intelligence explorations including ethical considerations.

The bootcamps focused specifically on enabling the facilitators of young citizens engagements to use an artificial intelligence based urban ideation platform in workshops with young citizens to visually and verbally prompt ideation visualizations of pre-selected relevant public spaces.

Additionally, the consortium set up workshops where professionals had to go through the same urban ideation and storytelling processes as the young citizens.

HafenCity University Hamburg  
Aarhus University  
Luleå University of Technology  
Vidzeme University of Applied Sciences

City of Hamburg  
Aarhus Municipality  
Luleå Municipality  
Valmiera Municipality

Children's Museum Hamburg  
Code for Hamburg  
ARIC Artificial Intelligence Center Hamburg  
Central Library Hamburg  
Coding Pirates Denmark  
DOKK1 Central Library Aarhus  
Teknikens Hus (Science Center) Luleå  
AI Sweden

**#Citizen Engagement**  
**#Sustainable Neighbourhoods**  
**#Co-Design**  
**#Young Citizens**



# Capacity Building – Target Groups

## Local Public Authorities

Local public authorities' representatives consisted of experts in sustainable urban transition, district and neighbourhood action planners and citizen engagement. Young citizens were a newer target group.

## Interest Groups

Interest groups' representatives consisted of experts in young citizens engagement, co-design, open urban data, and artificial intelligence. Associate partners, such as the Children's Architecture Center in Hamburg and Teknikens Hus in Luleå, had extensive experience in younger children engagement, broadening the education sectoral approach.

## Higher Education and Research Institutions

Representatives from higher education and research institutions were from the fields of urban transition, urban testbeds, experimental governance, stakeholder and citizens' engagement, digital transition in cities and communities, regional development, and artificial intelligence. Representatives from these groups contributed with varying focus and expertise from Hamburg/Germany, Aarhus/Denmark, Luleå/Sweden and Valmiera/Latvia.

HafenCity University Hamburg  
Aarhus University  
Luleå University of Technology  
Vidzeme University of Applied Sciences

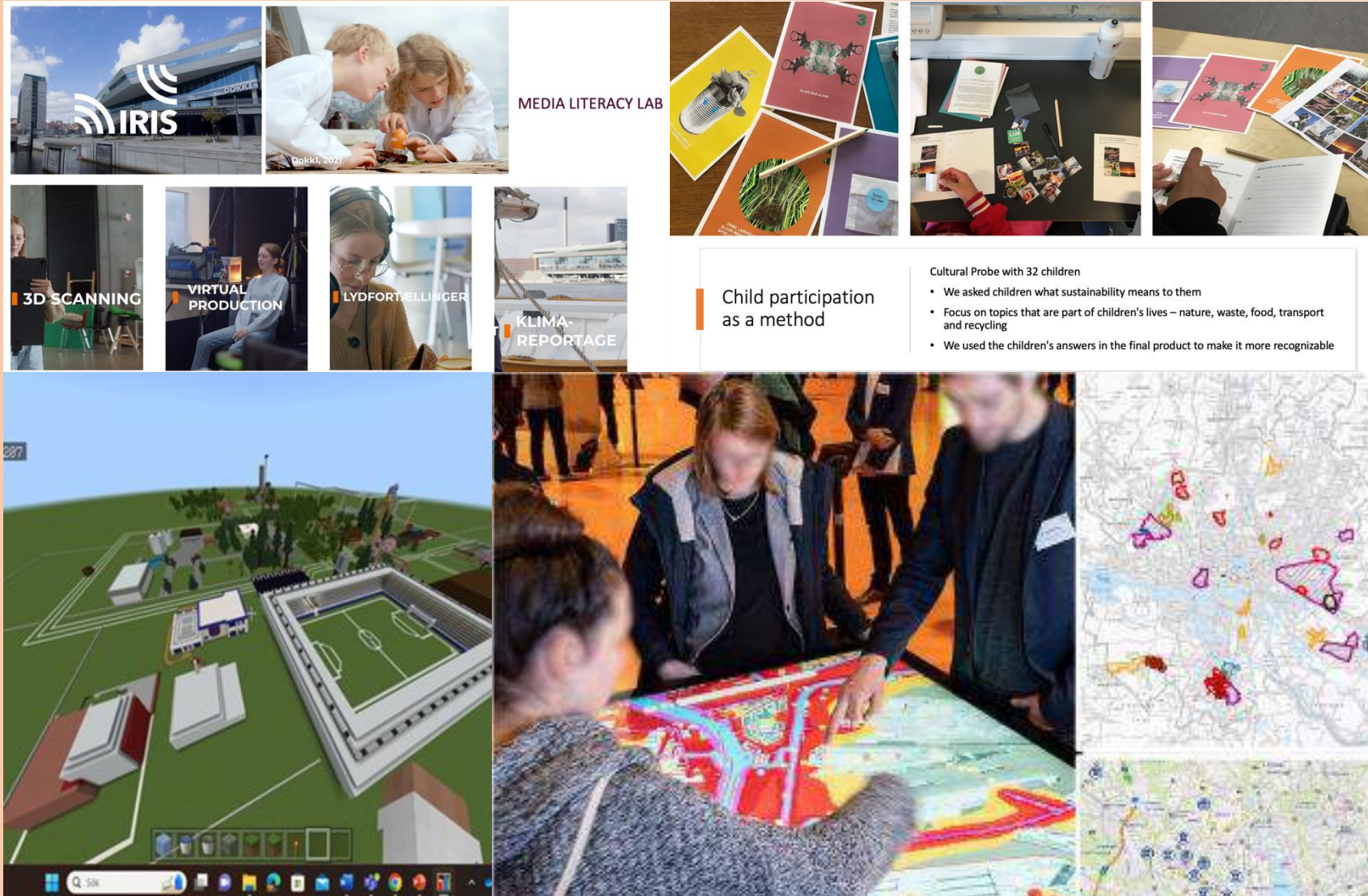
City of Hamburg  
Aarhus Municipality  
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Valmiera Municipality

Children's Museum Hamburg  
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AI Sweden

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# Capacity Building – Knowledge Workshops (Young Citizens Engagement)



UrbanTestbeds.JR staged a series of knowledge workshops to share best practices in young citizens engagement and discuss methodologies. The topics included:

## ➤ Climate Action & Imagined Futures

Data-driven Storytelling by children and youth with DOKK1 Data Democracy, IRIS Lab and World Space / Aarhus

## ➤ Gamification

Minecraft Simulation and Role Play / Luleå

## ➤ Urban Data Engagements

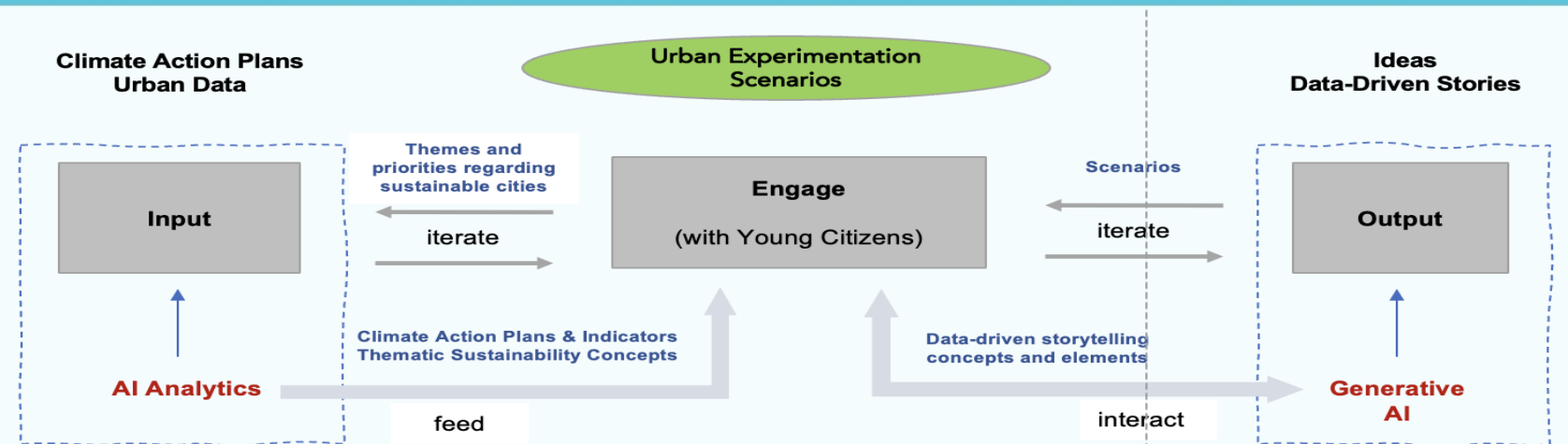
Interacting with Urban Data / Hamburg

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**#Young Citizens**

## Capacity Building – Knowledge Workshops (Artificial Intelligence)

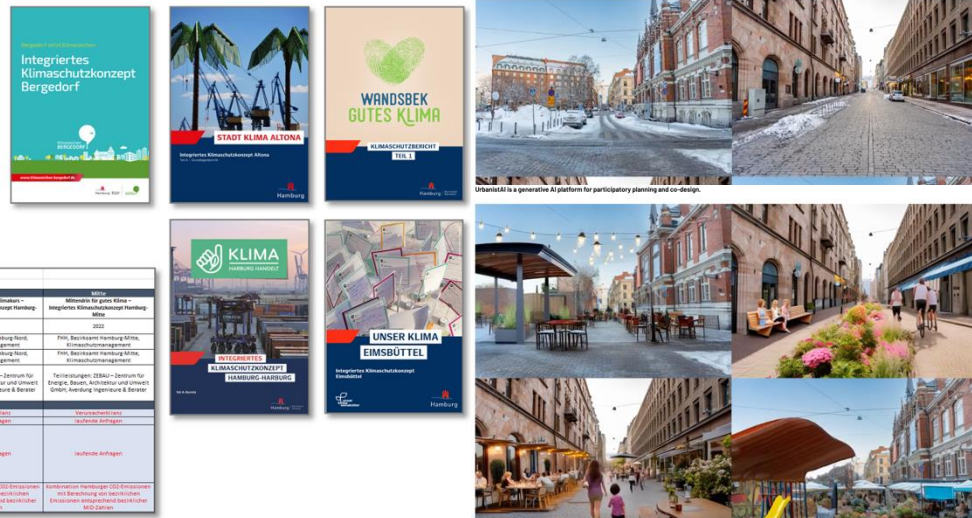
# UrbanTestbeds.JR

## Project Architecture – AI View



### Climate Plan Matrix:

- Data Collection of 7 Municipal Climate Plans of Hamburg:
  - Responsibilities
  - Status Quo Calculation
  - Sustainability Themes / Sectors
  - Transformation Scenarios, Pathways and Targets
  - Activities and Action Plan
  - Controlling Concept
  - Resources for Implementation

[illegible]

A series of knowledge workshops was staged to present and discuss artificial intelligence and urban data methodologies. The topics included:

- ## ► Climate Plans Deconstruction

Structures, Matrix, Questions / Hamburg

- Interaction with Climate Plans

Chat Bot Development, Trials / Luleå, Hamburg

- Urban Ideation & Storytelling

Verbal & Visual Prompting and Storytelling /  
Aarhus, Hamburg, Luleå

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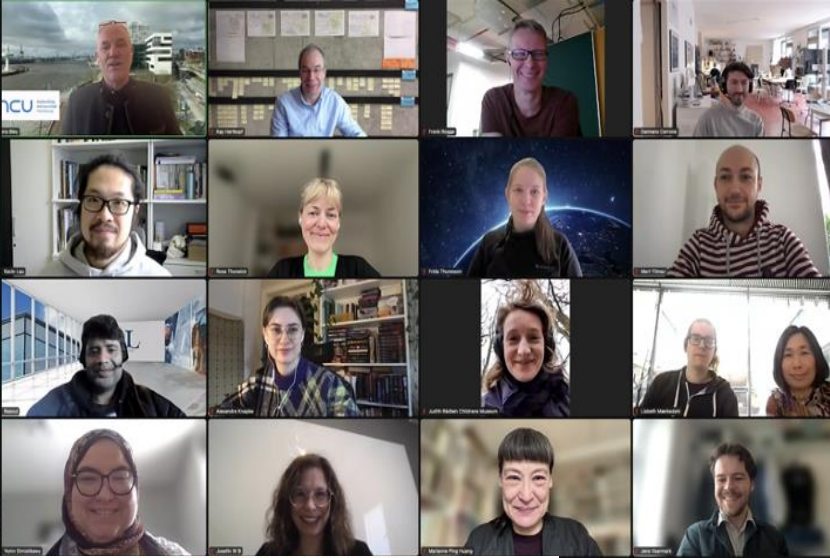
# Capacity Building – Bootcamps – Urban Ideation



**UrbanTestbeds.JR**


Generative AI for Participatory Planning and Co-Design with Young Citizens

Bootcamp / UrbanistAI / 15 March 2024

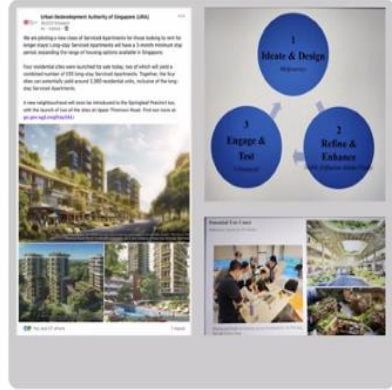


**General uses by cities**


**Participation**



**Urban planning**



**City strategy**



**A - WORKSHOP IDEATION -**

**GENERAL INTRODUCTION**  
 Write a brief introduction of the other points of this workshop template.

**THEME**  
 What is the general theme of the workshop? What topic should be explored?

**TIME HORIZON**  
 What is the time horizon of your scenario? What is the year you expect stakeholders to think about for their scenarios?

**IMPACTS / OUTCOMES**  
 How will you use the outcome of this workshop to generate impact? How are you going to share the results? Is the main outcome running the workshop itself?

**LOCATION/S**  
 What are the locations where you intend to run the workshop?

**STAKEHOLDERS**  
 Who are the group of stakeholders invited?

**CHALLENGES AND OPPORTUNITIES**  
 What are the challenges of your scenario? What are the opportunities to reimagine a new future?

**KPIs**  
 What are the measurable and quantifiable Key Performance Indicators of this workshop?

Developing methods to codesign the future of cities with children aged 5-11.



A series of bootcamps was staged to familiarize the facilitators and co-facilitators with the preparation and hosting of urban ideation workshops with young citizens. UrbanistAI from Finland coached the partners and associated partners.

Topics were:

- Ideation Planning
- Location Identification
- Verbal and Visual Prompting
- Using the visual repository
- Voting procedures
- Storytelling
- Documentation

#Citizen Engagement  
 #Sustainable Neighbourhoods  
 #Co-Design  
 #Young Citizens



# Capacity Building – Young Forum Open City



## Agenda:

- 10:00 - 10:30 Welcome**  
Forum Open City meets UrbanTestbeds.JR = Young Forum Open City  
Welcome / Agenda / Ignite Talks: Young Forum Open City re-invented / Young Citizens Future Cities
- 10:30 – 11:30 Code for Hamburg / “Young” Forum Open City Topics**  
(Young) Open City Vision Barcamp / AI Usage for Storytelling / Digital Participation,
- 11:30 – 12:15 Excursion: Research & Transfer Center DIGITAL REALITY (5<sup>th</sup> Floor / 5. Boden)**  
PaKOMM Demonstration – Interactive Table, AR, VR for collaborative place transformation
- 12:15 - 12:45 Digital Children’s Engagement @HCU**  
Highlights from a parallel session@CityScienceLab / Girls & Boys Day
- 12:45 - 14:00 Interactive Lunch with UrbanistAI / Generative AI for Urban Transformation Scenarios for all**  
Introduction / Lunch and Activity / Presentations
- 14:00 - 15:00 Young Citizens’ Engagement Cases from UrbanTestbeds.JR**  
Aarhus/Denmark - Luleå/Sweden - Hamburg/Germany - Valmiera/Latvia
- 15:00 - 16:00 World Café**  
Digital Young Citizens’ Engagement / Future of the Young Forum Open City / Informal Young Citizens\* Engagement / Climate Hackathons / ...
- 16:00 - 16:30 Idea Pitching & Closing**



Partners and associated partners shared best practices of young citizens engagements with multiple stakeholders.

City of Hamburg  
Children’s Museum Hamburg  
Code for Hamburg  
DOKK1 Library Aarhus  
Central Library Hamburg  
HafenCity University Hamburg  
Aarhus University  
Luleå University of Technology  
Vidzeme University of Applied Sciences

An urban ideation exercise with children was staged in the CityScienceLab of HafenCity University. The professional participants at the Young Forum Open City went through the same exercise as the children for capacity building purposes.

## Use Case:

Hamburg  
Young Forum  
Open City





# Capacity Building – Activity Workshop / Audio Storytelling (IRISLab)



Capacity building took place through bootcamps with stakeholder groups, but also by mirroring co-creation activities for young citizens.

During the Future Literacies-conference in Aarhus (Nov. 2023), UTJR team members replicated the children's and students' experience of creating audio stories with foley sounds, adapting planetary short fiction written by first year literature-students as part of the "Stories for the Planet" course.

The Audio Stories created by students are accessible with Aarhus Libraries, and stored at DIGTCOM Aarhus University.

IRISLab, DOKK1 offers media literacy and production environments for storytelling in primary school. From Fall 2023 IRISLab joined UTJR as an associate partner and enabler of both university students, researchers and urban developers.

# Capacity Building – Activity Workshop / World Square Aarhus

“I think we can use AI for creative workshops, whether it’s for kids or adults. It’s always like the first thing they’ll say is, ‘I can’t draw,’ and I think this is a good way to get past that kind of obstacle that blocks people from thinking big ideas. Maybe you can’t draw, but the AI will help you visualize your idea.” (Workshop Participant)

- Our workshop on World Square Aarhus aimed to engage local authorities and inspire the start of an ideation process. Our local partners were DOKK1 and Aarhus Municipality, with additional participants from Aarhus University. Our Participants gained insights into AI generation while exploring ideas in urban environments.
- With this workshop, our goal was to build interinstitutional capacities, focusing on how AI can transcend our perception of spaces. We demonstrated that ideation can emerge from different perspectives while sharing practices between us, as hosts, and the participants. Together, we co-developed new understandings of iterative processes across institutions and rethought how we can advance design practices.





# Learnings from Stakeholder Engagements

Stakeholder engagement has been an integral part of Urban Testbeds JR, with stakeholders, local authorities, and interest groups as our main target group for capacity building for urban ideation and co-creation for climate actions through engagement of young citizens.

Stakeholder engagement took place in knowledge workshops and boot camps, as well as in replication of workshops run with young citizens.

Stakeholders enriched the design process of UTJR by sharing – across testbeds - local frameworks and actions for citizen engagement, local learning formats for engaging children in climate issues and mitigation activities, and by making recommendations for technology engagement and not least giving advice on ethical considerations when engaging children with emerging technologies.

Take-aways for stakeholders are knowledge gained about children's and young citizen's capacity for co-creating for urban ideation, their skills in seamless technology and media literacy, and their competences in deliberation and decision making. Also, through our workshop replications, stakeholders gained access to a technology enhanced ideation and design process, which – though based on observations and data – also allowed for joint imagining and creativity in shaping urban scenarios.



# Urban Experimentation



# Urban Experimentation is:

Climate action  
plans &  
Structured  
urban data

Young citizens  
co-creating  
urban futures

Innovative  
ideas & Social  
integration

Participatory  
process &  
Technical  
solutions





# Introduction: Urban Experimentation and Urban Data

## What is urban experimentation and why is it needed?

Urban experimentation refers to the testing of innovative ideas and solutions in an urban context to address various challenges. These challenges might be related to sustainability, housing, transportation, social integration, and more. The experimentation could involve the use of new technologies, policy changes, grassroots initiatives, or the redesign of urban infrastructures.

Urban experimentation can be regarded as a process of learning, where cities become laboratories for testing out diverse ways of managing urban spaces and communities. Our experiments were designed around co-creating urban futures with young citizens which requires an understanding of the challenges ahead as well as related to the specific space or neighbourhood for which a future scenario should be developed.

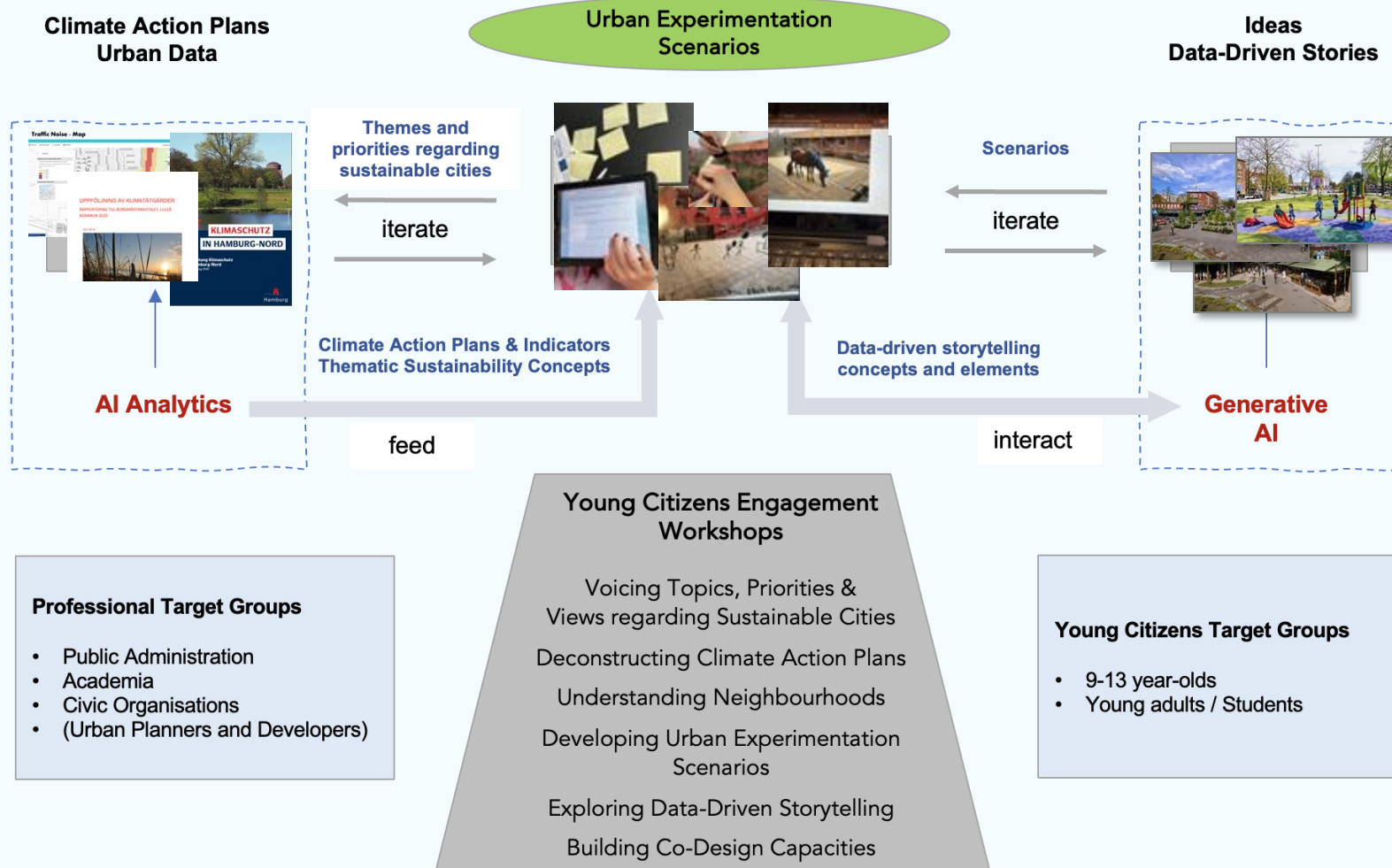
To achieve this, we collected documents related to climate change issues as well as sources of urban data we could use to create specific insights into the issues in general but also for a specific location like a quarter or neighbourhood.

The documents we used usually were climate strategies, climate action plans and transformation roadmaps. These served as a repository of knowledge to inform the young citizens about climate change issues, be it local or global.

Additionally, we explored sources of structured urban data which are usually held by the municipalities (ideally in a openly accessible urban data platform).

The following section describes findings around the availability and accessibility of this data as well as the relevance for our experiments.

# Urban experimentation - insights from data and co-creational scenario building



Our conceptual model involves urban data and climate plans to create a springboard for co-creational scenario building.

In our workshops we used local climate plans as an input for chatting with the documents and retrieving insights about climate change regarding the neighbourhood and beyond.

For Hamburg, Aarhus and Luleå several documents were used to create the corpus for the chat (see also use cases chapter for details).

This allowed us to create awareness for climate change related issues among our target audiences.

Based on these insights and the discussion about the environment and its preparedness for the anticipated changes we embarked on generating scenarios for a better urban future.

The scenarios were created using images of the spaces. The participants of the workshops prompted the AI with instructions what they wanted to change and which elements and objects they regarded as helpful to improve the public space.

# HAMBURG as a best practice for rich urban data and climate action plans

Hamburg has embarked on a comprehensive climate action program. Besides the overarching climate plan for Hamburg all of the seven districts were obliged to develop climate concepts including climate action plans and roadmaps. Dedicated teams to developing and implementing the plans have been established in the districts, a climate council was established to advise the Hamburg senate and the ministries.

In 2003 Hamburg established a central agency (Agency for Geoinformation and Surveying) to manage all geo data for Hamburg and provide services for its government agencies. A key resource we used for our co-creation events was the urban data portal (geo-portal) of the city. Besides the 3D model of the city and various maps it provides a wealth of data which can be leveraged for sustainable urban development.

To make this data accessible to the young citizens we followed two routes:

- Use the geo portal to work with maps, 3D models and specific data layers
- Ask climate action plans and related documents about specific facts leveraging AI

The urban data portal provides a wealth of climate issue related data like energy consumption of buildings, green roof potential, solar potential, emissions like noise, species and street trees.

Some of these data sets like street trees were used for our co-creation workshops. Moreover, we leveraged the ANN RADAR decision support tool to visualise solar energy potential and solar coverage rate (to which extent households could cover their electrical energy demand by solar power)

## Links:

Geoportal Hamburg:

<https://geoportal-hamburg.de>

Climate Plan:

<https://www.hamburg.de/klimaplan/>

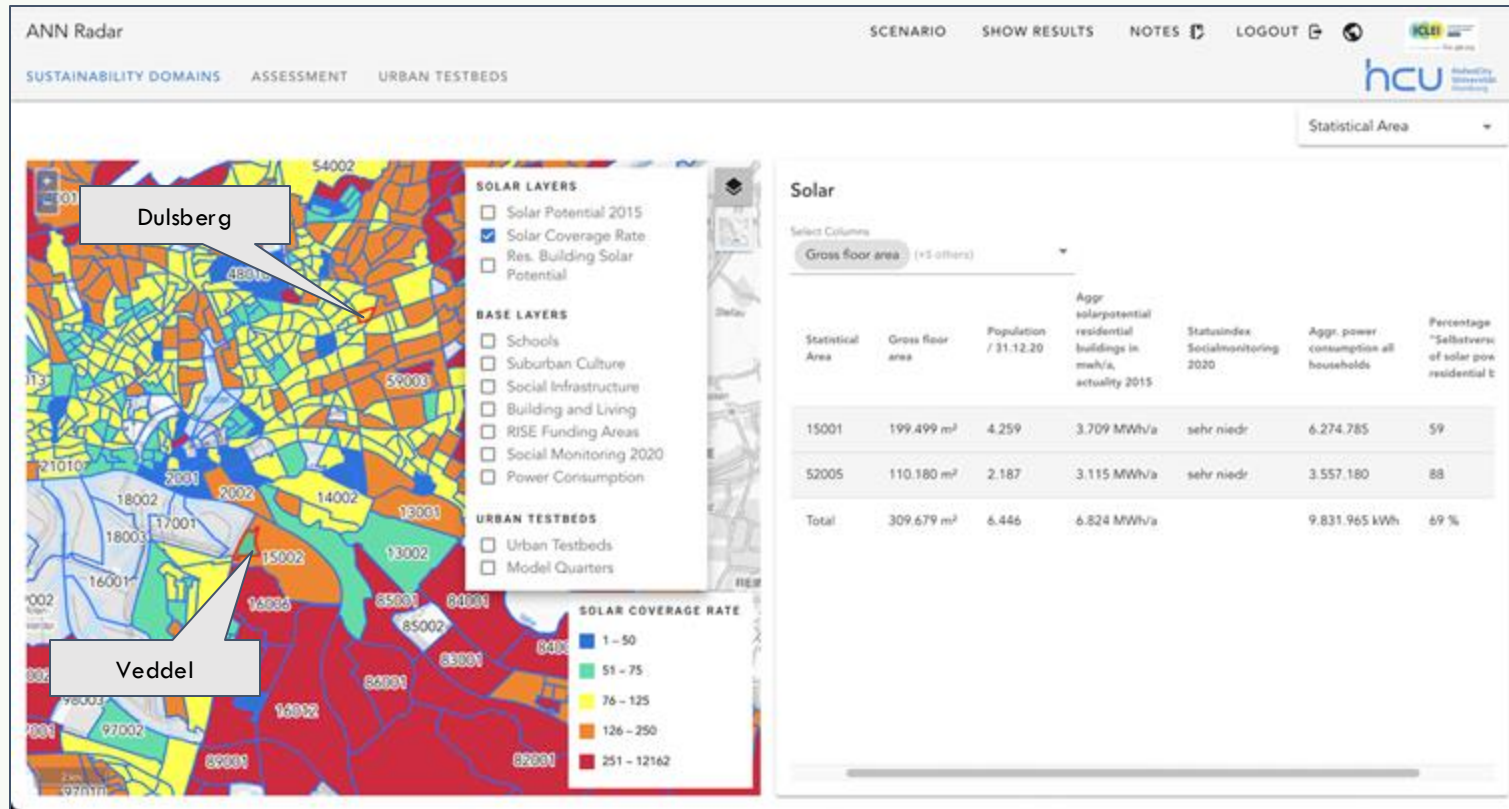
Climate Concepts of the districts:

<https://www.hamburg.de/klimaschutz-bezirke/>



# HAMBURG - taking a look at solar potential in relation to household's consumption

As an example, for using urban data the ANN RADAR system provides insight into solar energy harvesting potential related to the household consumption of electrical energy.



Finding suitable areas to establish solar energy harvesting would benefit if production and consumption of the energy would be geographically close to each other.

To assess the opportunity ANN RADAR provides a view which shows the solar potential related to the estimated consumption of electrical energy by the households in the area.

We took the mean consumption of electrical energy from national statistics for typical household sizes and applied these to the household sizes provided by the urban data hub.

At first sight we see that the solar coverage rate in Dulsberg (88%) at the statistical area level looks better than in Veddel (59%). However, to find suitable buildings we may want to take a closer look at the building block level.

These insights can help to identify the areas best suited to set up a testbed with the objectives which instigated the selection process

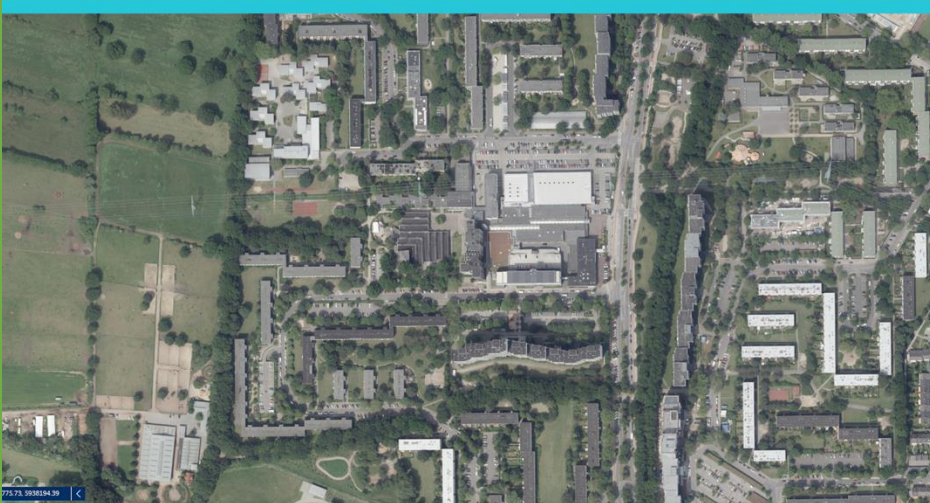


# HAMBURG - Best Practice “Our Digital Neighbourhood” / Hamburg

Klick and Neighbourhood – three dimensional



Klick and Neighbourhood – Aerial Photo



Klick and Neighbourhood – Map



Klick and Neighbourhood – Street Trees



Traffic Noise - Map



## Goals

Understand children's concerns regarding their neighbourhood including climate related issues but also liveability and wellbeing. Test applicability of spatial planning tools like GIS and specific data layers for the interaction with school children.

## Method

- 1) Use the 3D-Model of Hamburg and walk through a view of the neighbourhood.
- 2) Take a 2D representation of the same neighbourhood to explore the routes they take from their homes to school and to other places they frequently visit (e.g. playground, children's museum, school, home).

# AARHUS also addresses climate change issues and provides plans and data

Although Aarhus Kommune runs a website with geodata available it does not provide a fully implemented GIS system with access to all open data from the municipality. Thus, accessing the data becomes a more tedious task and can not be as easily accomplished compared to Hamburg. Additionally, the number of data sets is much smaller and different technical solutions to provide the data are utilised.

However, some applications have been built for specific purposes like planting trees. Additionally basic data like percentage of children in areas of the city or marital status are provided as maps. All of these as separate web pages and using different technologies. Besides this some tabular data is provided like the development in the number of homes in Aarhus Municipality (and underlying local areas), the distribution of family types over the years and the development in the number of families with children on Aarhus Island. Unfortunately, most of this data cannot be accessed through a standardised API or web service.

Aarhus recently started the participatory process to develop an updated climate plan which is planned to be finalised by the end of 2024.

For Aarhus we mostly built on the climate plan and related documents asking questions utilising the AI tools.

Aarhus is a common example for smaller municipalities which do not provide the richness of open urban data for the public like Hamburg which will potentially be caused by the smaller size of the administration of Aarhus and thus less resources to set up and run such a comprehensive urban data platform with public access.

## Links:

Urban Data:

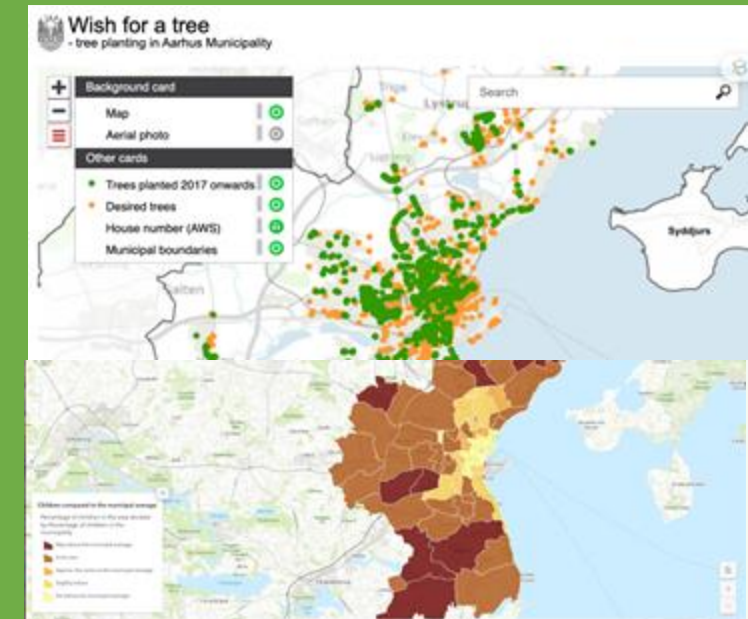
<https://gisportalen.aarhus.dk/>

Climate Strategy:

[https://backoffice.aarhus.dk/media/69807/pixi-strategi\\_uk\\_web.pdf](https://backoffice.aarhus.dk/media/69807/pixi-strategi_uk_web.pdf)

Climate Plan:

[https://backoffice.aarhus.dk/media/69806/klimahandlingsplan-2021-2024\\_gb\\_web.pdf](https://backoffice.aarhus.dk/media/69806/klimahandlingsplan-2021-2024_gb_web.pdf)





# AARHUS - Working with children – Chatting with climate action plan



## Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Topics:

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues



# LULEÅ offers land use and infrastructural but also some climate related data

Similarly, as for Aarhus the richness of the data on the geo portal is limited but Luleå offers a Web-GIS with several data layers similar to Hamburg but on a smaller scale and with less data layers.

Beyond these general tools Lulea provides a climate dashboard which summarises eight key indicators to track it's path to no impact on climate change: Emissions of carbon dioxide excluding industry, Energy use in homes, Energy use per inhabitant, Renewable fuels in public transport, Share of green cars, Solar energy, Emissions of carbon dioxide from transport, Charging points for electric cars

Additionally, the national Swedish geo data catalogue offers a large number of data sets which can be assessed via a web interface as well as standardised APIs.

Besides infrastructure related information some climate and environment related data can be found like solar potential, air quality and water protection areas. Some of these are only available through national portals like the Swedish Meteorological and Hydrological Institute.

The nationwide data does often not provide data at a granularity suitable for assessing smaller geographical areas like one city or parts of a city.

The climate strategy and actions are described in various documents like Vision Luleå 2040 and Follow-up of climate measures report to the mayor, which amongst other have been used to inform the chat bot utilised for our children' workshops.

## Links:

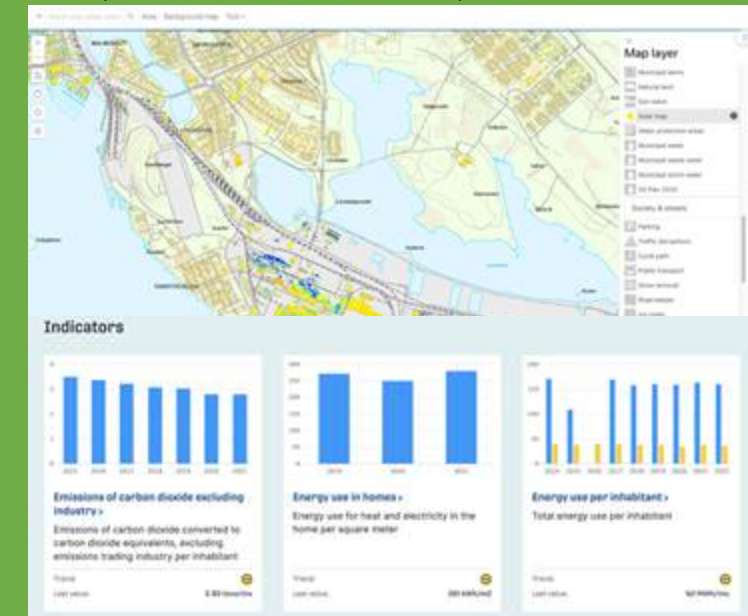
Urban Data:

<https://kartor.lulea.se/kommunkarta/>  
<https://mal2040.lulea.se/klimat/>  
<https://www.lansstyrelsen.se/norr-botten.html>  
<https://ext-geodatakatalog.lansstyrelsen.se/>  
<https://www.smhi.se/>

Climate Strategy/Climate Plan:

<https://www.lulea.se/samhalle--utveckling/vision-lulea-2040/overgripande-mal-till-2040.html>

<https://www.lulea.se/kommun--politik/sa-arbetar-vi>



# LULEÅ Teknikens Hus – Chatting with the climate action plan



## Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Topics:

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues

# Young Citizens Engagement





# Young Citizens Engagement is:

Voicing Topics, Priorities

&

Views regarding  
Sustainable Cities

Deconstructing Climate Action Plans

Understanding Neighbourhoods

Developing Urban Experimentation  
Scenarios

Exploring Data-Driven Storytelling and  
Building Co-Design Capacities

# Young Citizens Engagement

Understanding young citizens engagement requires insight into what drives engagement, how culture is an ever-evolving and intricate factor, how citizenship is rooted in culture, and what ethical considerations are needed when engaging young people. The answer is not straightforward, but in this chapter of the playbook, we've aimed to provide insights and examples of how these perspectives have shaped our approach to understanding and structuring our work around youth engagement.

First, we'll guide you through **"Children's and Youth Culture and Citizenship"**, offering a broader understanding of the cultural principles that shapes our work. This is followed by an exploration of **"Why and How to Engage Young Citizens?"** Next, we'll dive into the **Ethical Principles** that guide our approach. The goal of these sections is not only to explain how we've designed our engagement workshops but also to offer you insights on how to develop your own.

To briefly summarize: **Understanding Culture** is crucial to knowing how to engage your participants. You need to be clear on why you want to engage and know how to structure a process that leads to a positive, meaningful experience for the children and young people involved. When engaging young citizens, especially with artificial intelligence, it's important to always prioritize the child's perspective. By keeping key considerations like non-discrimination, the best interests of the child, and respect for their views at the forefront, you can create engagement that leaves a lasting impact on your community and reveals potential future outcomes for local development through the eyes of the children.

The playbook will develop a guide to the various steps and design principles, while stakeholders and challenges will be locally identified by highlighting cases and Deep Dives important to the local understanding.

#Youth Culture and Citizenship

#Young Citizen engagement -The Why's And How's

#Ethics of Engaging Children in Future Technologies and AI

#Wicked Problems

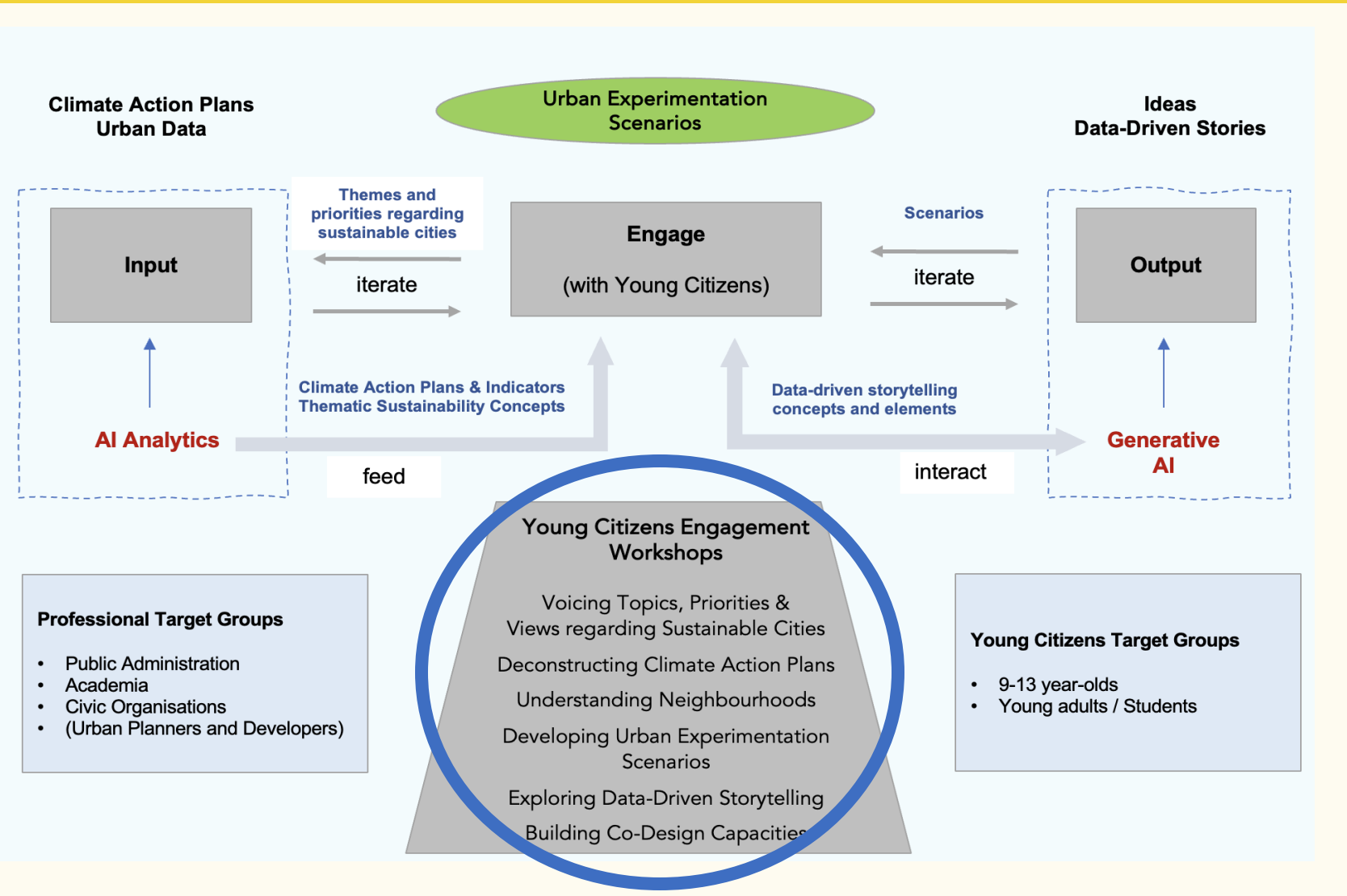
#Co-creation / Design Thinking

#Rethinking Children's Spaces

#Generative AI for Scenario Building



# Young Citizens Engagement - Where are we in the concept model?



In the context of the concept model this chapter of the playbook focuses on Young Citizens Engagement and the associated workshops. It lays the foundation for our workshop design and our understanding of how to effectively engage young citizens. Positioned between AI analytics, urban data, and climate action plans on one side, and data-driven storytelling and generative AI on the other, this section serves as the crucial link between data and storytelling. Our aim is to merge these elements through an exploration of youth culture, AI and ethics, and a design journey that seeks to engage children in urban experimentation scenarios.

Additionally, this chapter will demonstrate our combined workflow and insights by showcasing various workshops experiencing with data-driven storytelling. This will illustrate how urban experimentation can be both varied and deeply rooted in a diverse, European youth-culture perspective, while showcasing how different workshop scenarios create different solution proposals for the unique problem.

## Children's and Youth Culture and Citizenship

**“The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice.”**

- UN Convention on the Rights of the Child: Article 13, paragraph 1:



# Children's and Youth Culture and Citizenship

First, we want to introduce Children's and Youth Culture, as well as Citizenship. This section provides insight into our cultural context in the Nordic countries and gives insights to why the workshops are designed as they are.

To foster meaningful engagement, it's crucial to understand the underlying culture, as this is not easily transferable between nationalities. For us to engage effectively, we must first grasp the cultural framework we're working within. Therefore, what follows is a brief introduction to Children's Youth Culture and Citizenship.

The concept of Children and Youth Culture is relatively recent within cultural politics and frameworks, particularly in Denmark and the Nordic countries, emerging around 1945 and gaining broader influence from the 1960s onward. From that point on, cultural policies have significantly shaped the role culture can play in civic society and democracy, especially when self-directedness, playfulness, and communal agency are supported in children's and young people's everyday lives, as well as in more formal pedagogical and educational contexts. This aligns closely with the UN's Convention on the Rights of the Child (1989). The Convention, along with national policies on children's welfare, their right to education, freedom of information, self-directedness, artistic expression, and the ability to impact their own futures, also influences current policies on children's engagement with climate crises, future technology, AI, and social media.

*#Youth Culture #Citizenship  
#Nordic Culture*



Børnekultur i Danmark 1945-2020  
Redigeret af: Merete Dael, Jan Helmer-Petersen & Beth Juncker. GAD, Copenhagen 2021

Delanty, G. (2003). Citizenship as a learning process: disciplinary citizenship versus cultural citizenship. *International Journal of Lifelong Education*, 22(6), 597–605. <https://doi.org/10.1080/0260137032000138158>



# Children's and Youth Culture and Citizenship

On par with the UN, Nordic youth culture encompasses a broad understanding that emphasizes the wellbeing of the child. Besides focusing on wellbeing, there is also an emphasis on the child's agency by considering what children themselves can. This focus has resulted in what is described as a trinity. The trinity consists of three concepts regarding children's culture and its creation. The first is: **Culture for children**, which is primarily culture created by adults with children as the audience. Secondly, there is: **Culture with children**, where children and adults are active participants in co-creating. Lastly, there is: **Culture by the children**, where children are self-creating culture with or without adult interference, meaning adults guide the process of creation, but children are the decision-makers.

In addition to this way of looking at children's culture and its creation, a simple model for understanding children's culture emerged: a triangle for cultural creation. This model represents an overall trend in creating cultural offers. The model consists of three elements. Firstly, there is a focus on: The Rich Experience, emphasizing both the quantitative and qualitative aspects of artistic expression, meaning that the cultural offer must consider what its creation offers the user. Secondly, The Nuanced Understanding, which is a tool or process for understanding the nuances, ideas, form, and structure of the cultural experience. Thirdly, The Independent Creation, which is a process that gives participants the possibility to try things out themselves—a chance to create and express themselves culturally while providing substance for individual thought. This triangle of cultural creation can be used when creating culture for children and understanding how to create it and what value is generated. This triangle is one of the foundations, together with the understanding of who the culture is for.

***#Culture for, with and by the children***

***#Triangle for cultural creation***



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Redigeret af: Merete Dael, Jan Helmer-Petersen &  
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Delanty, G. (2003). Citizenship as a learning process: disciplinary citizenship versus cultural citizenship. *International Journal of Lifelong Education*, 22(6), 597–605.  
<https://doi.org/10.1080/0260137032000138158>

# Children's and Youth Culture and Citizenship

The dimension of citizenship, as Delanty explains, is didactic, involving a “distinguishing between individual learning processes and collective ones” (Delanty, p. 597). He explores how we learn in different cultural situations and how learning has shifted from being something connected to our culture to something more formalized. Delanty argues that learning involves empowerment, enabling individuals to perpetuate themselves. It's important to emphasize the processual nature of learning—an ongoing, dynamic process rather than a static outcome.

Delanty's perspective on learning integrates a cultural aspect, viewing it as an act of creation or engagement. Learning requires active participation from the learner, with cognitive structures connecting various frameworks and codes. Therefore, learning becomes a cultural process of creation and construction (Delanty, p. 601). Delanty goes on to argue that learning should not only be seen as an individual endeavour but also as a means of social construction. Through this process, individual learning is transformed and coordinated into collective learning, which ultimately manifests in social institutions (Delanty, p. 601).

This insight is key to understanding how learning connects with culture, how we as individuals are shaped by our surroundings, and how, as participants, we can influence the learning process.

## #Cultural Citizenship



Børnekultur i Danmark 1945-2020  
Redigeret af: Merete Dael, Jan Helmer-Petersen &  
Beth Juncker. GAD, Copenhagen 2021

Delanty, G. (2003). Citizenship as a learning process:  
disciplinary citizenship versus cultural citizenship.  
*International Journal of Lifelong Education*, 22(6),  
597–605.  
<https://doi.org/10.1080/0260137032000138158>

# Introduction to Young Citizen Engagement – The Whys And Hows

This part of the playbook will revolve around engagement with, for and by young citizens. It will be an introduction to the scientific ideas behind the works, the ethics of young citizen engagement, design processes and the foundation for different understandings of youth culture.

**Importance** - Why is this important? The developing process for the future is an intricate matter. It revolves around city planning, green development and scopes for a world. In this case it is important structure the decision making horizontally, so the different actors across the spectrum can have a say. Especially young citizens, as their future is the one at stake.

**Approaches** - The Approaches for this is to give an understanding of youth culture with the aim to build resilient Young Citizens. We will do this by highlighting the design process, the understanding of youth culture, the engagement of and with children and the ethics behind working with children.

Why would they care? The world is a dwindling place where resources are scattered and only available to the few. We must create an environment where the youth can be a part of the decision-making-processes. So why would they care? The process of being part of decision-making is not direct and straightforward, but with the guidance of peers, teachers, grownups the understanding of the future can be highlighted and translated into a format that children and youth can be a part of.



## The Whys And Hows [continued]

*„Engaging the public in planning for the city through participatory means is an essential factor for achieving sustainable urban development. A participatory process is a channel which involves the reflection and the exchange of ideas between the city council and city stakeholders.“*

(UN-Habitat, 2020)



# Exploration: Why and how to engage young citizens?

## General need and rationale ... [1, 2, 6]

Several reasons can be found, why children and young citizens should be deeply involved in the debate about climate change and the development of mitigation strategies and actions utilizing scientific facts and data.

**Future Impact:** Young people will be the most affected by the consequences of climate change. They have a right to participate in decisions that will impact their quality of life in a climate-altered world [1].

**Advocacy and Engagement:** Young people have led efforts to advocate for and achieve deliberate and meaningful engagement in the global dialogue about climate change. Their participation has amplified advocacy efforts and put pressure on states to meet their commitments on emission reductions [1].

**Innovation and Action:** Young people are driving climate change accountability in both formal and informal settings. They are using new media technologies to galvanize their peers and other generations to collectively hold governments and private actors accountable for their contributions to, and lack of action to counter, climate change [1].

**Rights and Equity:** It is required that „participatory approaches to climate change must be designed by working synergistically with climate-vulnerable groups like children, youth, public health and human rights practitioners/scholars . This is to holistically address the social, health, and environmental impacts of climate change and root causes of injustice“ [1].

**Education and Awareness:** Educational responses that emphasize participatory, place-based and transformative approaches to learning are likely to be more generative and responsive to young people's needs [2].

**Data and Evidence driven Approach:** Supporting these efforts, „more holistic data collection is needed to better inform evidence-based climate policies that operationalize human rights and public health co-benefits“ including engaging youth in data collection which can ensure their lived experiences are reflected [2] .

Since climate science is heavily driven with big data, engagements with students shouldn't only focus on using data as a tool but also engage students in the practice of analysing and interpreting large data sets [6]

**#Advocacy and Engagement**  
**#Innovation and Action**  
**#Rights and Equity**  
**#Education and Awareness**  
**#Data and Evidence driven Approach**

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# Exploration: Why and how to engage young citizens?

Questions about and what children know about climate change ... [3, 4, 5, 6]

Children's understanding of climate change is varied and influenced by multiple factors, including their information sources and personal experiences. They are aware of the causes and effects of climate change, and some are even taking steps in their daily lives to mitigate its impact. However, there are also misconceptions, indicating a need for more accurate and comprehensive climate education.

Children's understanding of climate change (ins Spain) is influenced by various information channels. The three main digital media sources are TV (82.8%), the Internet (56.2%), and social networks (49.4%).

The children identified pollution (70.1%) as the main cause of climate change and the increase and changes in temperature (61.7%) as the main effects. When asked about the main greenhouse gas in the atmosphere, the majority responded CO<sub>2</sub> (63.5%), which is incorrect as the main greenhouse gas is water vapour [3].

Children's questions about climate change related to its nature, reality, causes, impacts, and solutions. Some children expressed scepticism about climate change, while others asked about its impact on 'us', indicating that they consider themselves responsible for resolving climate change [4].

Children were found to be enthusiastic about using dynamo flashlights in a dark room when the batteries of the battery flashlight ended. They were able to construct their own knowledge about climate principles and effects and how important individual everyday life routines are important for climate changing adaptation [5].

Questions were found to be in three categories: (a) direct observation questions to clarify confusion about the co-creation / learning activity, (b) to inquire the unknown and acquire scientific reasoning from various disciplines and (c) future projections which can be very emotion-laden [6].

The topic of climate change is complex and involves many different scientific disciplines thus needing extensive research and information gathering. A good opportunity to leverage AI tools to speed up the process and extend the knowledge base to be utilised in the student activities.

## *#Children's understanding of climate change*

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# Exploration: Why and how to engage young citizens?

## Co-creation with children and youth ... [1, 5, 8]

Children can play an active role in co-creating solutions to climate change.

Creating opportunities for the meaningful engagement of young people is derived from the Human Rights Based Approach to climate change which involves official representation in international bodies as well as empowerment with capacity, skills and knowledge and participation in policy and decision making [1].

Based on the assumption that interdisciplinary and participatory research involving academy with school is central to provide the effective climate literacy and adaption in new teaching–learning practices for climate change education, children (age 3-10 years) were stimulated to formulate hypotheses, perform experiments, describe and explain the results, and draw their own conclusions. They were also asked about their everyday life routines and what they could do to look after the Earth. The children's responses reflected their current behaviours and knowledge-action concepts associated with the development of renewable sources and environmental safety scenarios [5].

Educational responses to climate change should give children and youth agency to be active participants in their educational choices. The paper suggests two educational shifts: adopting community as curriculum, where knowledge production becomes a participatory process practiced with and amongst community members trying to solve local problems, and adopting a connected learning approach, which harnesses the advances of the digital age with an equity agenda to address local issues.

In both studies, the emphasis is on involving children in the process of understanding and addressing climate change, giving them a voice and agency in co-creating solutions. This approach not only enhances their learning but also empowers them to take action in their own lives and communities [8].

## #Agency

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## The Whys And Hows [Exploration]

*“Children and youth participation in decision-making processes has been shown to be beneficial in many aspects, and its contribution to strengthen democracy, by enhancing the democratic participation, is of importance to highlight.*

*Essentially, children and youth participation can be described as a democratic practice in which they actively engage with their social environment. Children and youth participation in urban planning must be understood in a flexible manner, since it includes two dimensions, of both informal- and formal participation.”*

Emma Norss: *Children and youth participation in urban planning - Are we there yet?* (2021) Supported by the project *Planning with Youth: a tool and a framework for an engaging, meaningful and forward-looking participation of youngsters in shaping attractive and sustainable living environments*, funded by FORMAS,





# Young Citizens Engagement

[Exploration  
from cases]



# Exploration: Why and how to engage young citizens?

These are some of the typical questions children ask, and we believe they should be central to our work and design approach:

- What is climate?
- What is the greenhouse effect?
- Why is the climate changing?
- What problems are caused by greenhouse gas emissions?
- How can each of us take care of the Earth?
- How can doing a little change a lot? [5]

For us, this meant we needed to connect urban data with AI. We argued that AI is a crucial tool for breaking down climate plans in a way that is understandable and engaging for children. By integrating AI into our storytelling, we aimed to facilitate ideation and creative thinking with children.



5) Azul, Anabela & Reis, Catarina. (2017). Climate Change: Doing Little Can Change a Lot! Children's Knowledge-Action About Climate Principles and Effects.

# Engagement Workshop: Asking AI-Chatbots about Climate Change

## AARHUS – Save the World game and chat bot exploration of climate plans

4



### Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

### Methods

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues



UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future

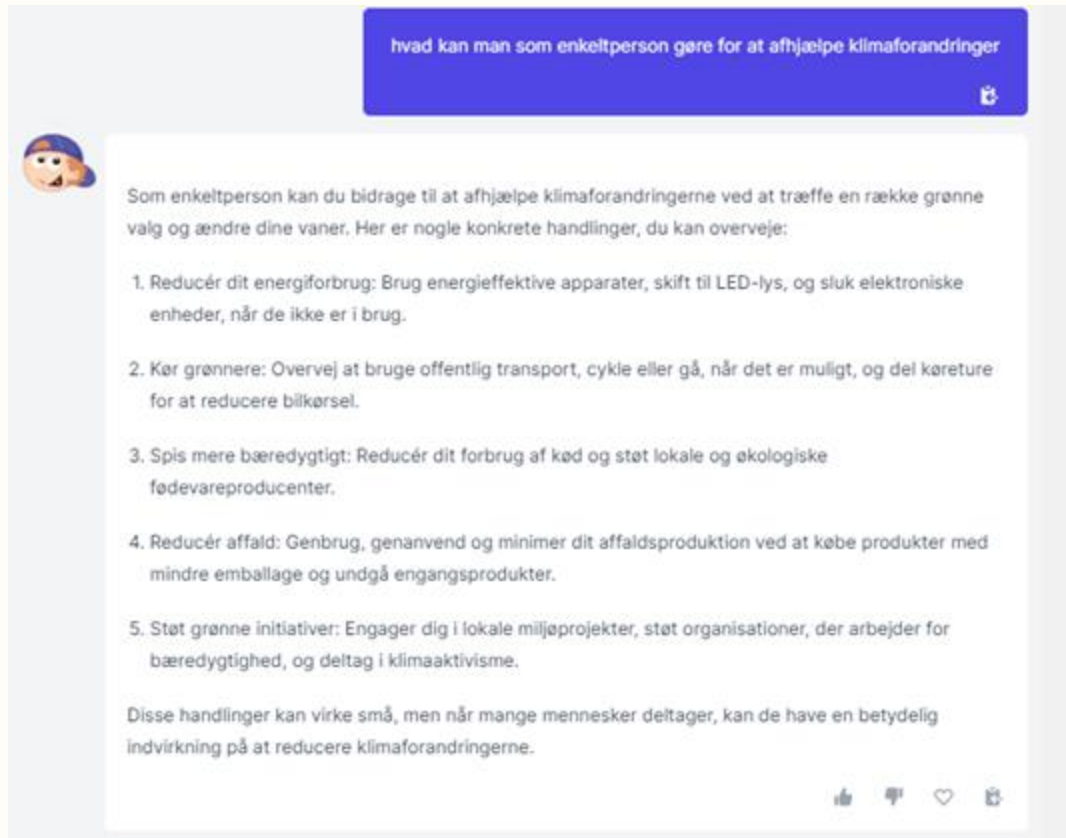
This example is from our workshop where the goal was to identify key climate problems with the children. The typical questions asked by children is centered around understanding climate issues.

### Workshop Outcomes:

- Using AI to Suggest improvement of the game
- Identified climate change topics that young citizens are curious about
- Identified climate change data and plans needed to feed the chatbot.

## Example from Engagement Workshop: Questions asked by children in workshops in Aarhus and Luleå via chatbot

### What topics do the kids ask about?



<https://easy-peasy.ai/chat>

Our learning using the chatbot was that it effectively answered most questions, though some responses were in English instead of the user's language, and others provided lists of links rather than directly addressing the content of climate change plans.

To improve accuracy, it's important to incorporate more reliable sources on climate change, particularly for smaller cities like Luleå, where municipal or nationwide climate change plans might offer more detailed information.

Despite these challenges, the kids were able to engage with the climate change plans, gaining a basic understanding of climate change, their role in it, and the specific plans for their city or country. The workshop conductors successfully used these reliable sources to guide the kids in exploring the plans.

In climate-focused urban planning workshops, the chatbot can serve as a valuable tool for helping kids interact with climate change plans from their cities and countries. For instance, by training Easy-Peasy using these documents, kids can ask direct questions about climate change or related plans and apply that knowledge during co-design workshops, making the learning experience more interactive and relevant.

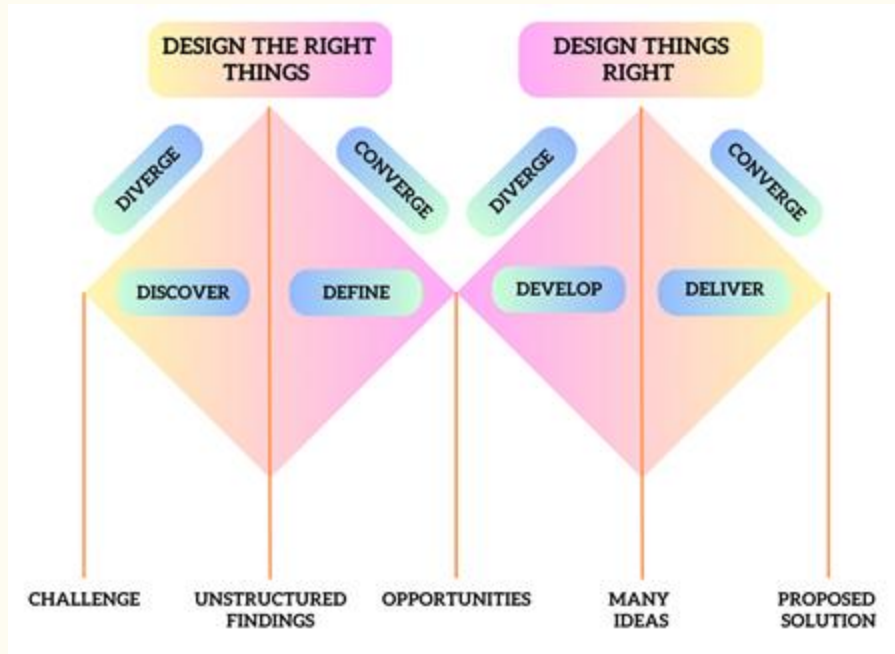




# Workshop Design

# Co-creation framework and practice -Approaches to our engagement workshops

A Scenario Design for Experimentation, based on design thinking (Double Diamond, British Design Council 2012) and multiple iterations.



For either short or longer workshops, experimental discovery, ideation process, rapid prototyping, failure and reflection, followed by iteration(s) are at the core – the process may feel chaotic, and it is by no means linear and simply executing on ideation/one big idea. The process is circular, always iterating and based on ‘sketching’ in one workshop and across workshops, in one project and across projects, with the respect for co-creating with others (team, stakeholders, users) and for the material circumstances of an entangled or wicked problem.

And - always aim to experiment and design also for those unnoticed and without voice.



The multimodality in engagement design may – if playful – be seamless, although the formal approach may move in sequences targeting one media or technology. As the UrbanistAI, Rethinking Children's Spaces-workshop (chap. 4, 9) in Aarhus showed, when ideating and designing the 4th-graders moved seamlessly between drawing, prompting, and back.

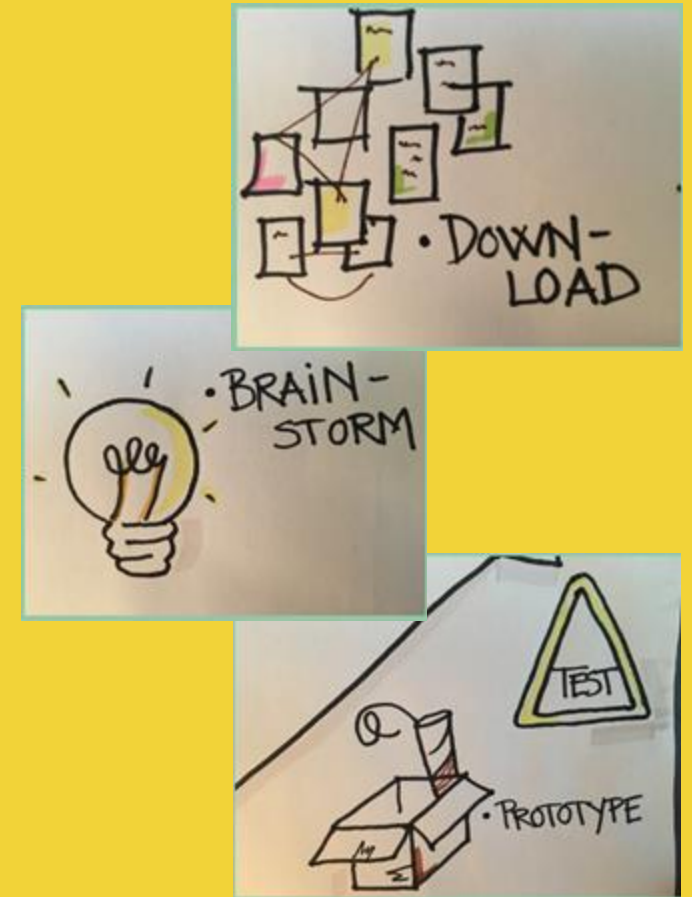
# Design - Methodical Process and Co-creating (1/2)

Co-creating through design thinking processes is an optimistic and collective process, which puts all our faculties and competences into play when asking 'how might we?' and 'how do we co-create?' Design processes however, need not be solution-driven (though they often are), they may also be future-scoping through imagination and speculation, all the same creating images or stories for the future which will inspire the present.

"For many people, design thinking resembles a kind of messing around, hoping to find a nice idea. It doesn't look very professional, as there are always workshops where questions are reformulated again and again; ideas are embodied with Post-Its that are everywhere; and prototypes look silly, made with DUCT tape, carton and Lego. But there is a method behind the madness.

Important to know is that a consequence of the cartesian dualism [of mind and matter, which still prevail in our knowledge paradigm,] is that most people believe that whatever we do is a result of what we think. Consequently, any sketch we produce or prototype we build is a result of an idea that resides in our heads. Designers 'know' that they conceive their ideas in a different and much less linear (think>sketch) way. Although they start with something in their mind, they explore ideas through sketching. While sketching, they get ideas. So, design 'thinking' is much more about design thinking/doing. It was Donald Schön (1983) who first described the 'reflective practice' of designers, the core of design thinking, and the way to deal with *wicked problems*."

Guido Stompf: Design Thinking in Practice, #dariahTeach 2021:  
<https://teach.dariah.eu/course/view.php?id=60> )





## Design - Methodical Process and Co-creating (2/2)

*“I began analysing what it means to be creative and how we can express that. Maybe it's something we convey with a light bulb, or perhaps through a drawing pencil, sketching—something along those lines. I'm not entirely sure, but I was searching for ways to express creativity. Once I chose a frame, I started ideating. I explored what was possible within that frame by simply drawing out different ideas.”*

*“As I ideate, I explore within the frame. During this process, I reflect. I create sketches not because I know exactly what I want, but because I'm exploring and reflecting on each iteration. I make small improvements, reflect on them, tweak the sketches a bit more, and continue reflecting. This ongoing process of sketching and reflecting leads me to something I either like or don't like. It's reflection in action.”*

In this video, Guido Stompff, Professor of Design Thinking at Inholland University of Applied Sciences, explains how to practice Design Thinking (<https://www.youtube.com/watch?v=t39zzDeOrro&t=138s>)

The video is part of the course 'How to Practice Design Thinking and Making' available on #dariahTeach (<https://teach.dariah.eu/>), an open educational resource for teaching and learning content in Digital Humanities and Digital Cultures.

The OER has been conceptualised by Susan Schreibman, Marianne Huang, Costas Papodopoulos, and Rikke Toft Nørgaard, and was funded by Creative Europe Media as part of the project 'Ignite: Design Thinking and Making in the Arts & Sciences' (<https://ignite.acdh.oeaw.ac.at/>).



# Co-creation / Design Thinking - Approaches to our engagement workshops

## Design Thinking

We draw inspiration from the concept of Design Thinking when creating our workshops, which is defined as "a process of creation with the intent of solving problems" (Understanding Design Thinking, n.d., p. 1). Design Thinking can be understood as a way of thinking that focuses on both identifying problems and devising solutions. It is a mindset that designers adopt to address and resolve challenges. Design Thinking is often characterized as a unique perspective on the world, as well as "a process of activities and methods that reflect and support that worldview" (Understanding Design Thinking, n.d., p. 3). This perspective enables designers to achieve their objectives and develop solutions. Simply put, Design Thinking is solution-oriented thinking. However, it is important to recognize that Design Thinking cannot be confined to standardization; rather, it is a way of understanding the world that generates possibilities and solutions for various problems.

The methodology of Design Thinking revolves around a straightforward pattern:

1. Empathetic discovery
2. Problem definition
3. Idea generation
4. Creation
5. Evaluation

(Understanding Design Thinking, n.d., p. 5).

This methodology forms the foundation of how we structure and design our workshops. While we do not follow this approach rigidly, it serves as a source of inspiration for the organization and development of our workshops.



Clarke, R. I. (2020). *Design Thinking*. American Library Association. (s. 4)

**“Because these ‘wicked problems’ cannot be solved through traditional scientific means and may only have better or worse resolutions rather than a single ‘correct’ answer, creative approaches like design are necessary.”**

**“In addition to problem solving, design also relies on problem finding and problem framing. First, we have to understand what the problem really is.”**

Clarke. R. I. (2020). *Design Thinking*. American Library Association. (s. 4)

Why focus on Wicked Problems and design thinking in regard to our work? To answer this, we want to highlight our Deep Dive into 'Gør det Samm'n.' This project, in Aarhus Municipality, aimed to activate and engage all the various actors in Aarhus who had a voice in addressing climate challenges. By examining 'Gør det Samm'n,' we learned the importance of approaching the problem from a different perspective. We realized that engaging young citizens as part of the solution requires a multifaceted approach—there isn't just one solution, but many ways to achieve the goal. This philosophy is reflected throughout our work. Therefore, during the design process, we drew inspiration from this approach to shape our workshops.



# AARHUS MUNICIPALITY - Gør det Samm'n - Do It Together-Engagement Principles (1/3)

## Why is this important?

Gør det Samm'n is part of Aarhus municipal plan towards a green future (Aarhus Omstiller/ Aarhus Transitions). The Citizen Engagement part of Aarhus Transitions comes with two action plans: one action plan in relation to Adult Citizens and an action plan regarding Children. "Gør Det Samm'n" can be translated to "do it together" and revolves around the question of how citizens hold agency in succeeding in the green transition. Overall, the two action plans build on citizen engagement, which is why "Gør Det Samm'n" may provide transferable action-designs for other engagement-approaches and -projects.

"To succeed with the green transition, it's necessary for all of us to examine our habits closely. We need to see if we can make the next meal, the next drive, or the next purchase a little greener today than it was yesterday - whether it's at work, in our leisure time, or at home. Developing new habits requires more than just knowledge and good intentions - it takes effort, perseverance, and a good dose of enthusiasm." (*Gør det Samm'n*)

The Toolbook sketches different approaches to promote the desired behavior and foundations for engaging in a green transition.



<https://itk.aarhus.dk/projekter/arkiv/goer-det-samm-n-udvikling-af-groen-toolbox-til-medarbejdere-og-borgere>

## AARHUS MUNICIPALITY - Gør det Samm'n - Do It Together-Engagement Principles (2/3)

Gør det Samm'n is a toolbox for self-directed citizen engagement, which includes Youth NGOs such as The Green Youth Movement who has over the last two years published manifestos on sustainable and green cities and sustainable agriculture.

Children's engagement on the other often takes off from formal education in primary school, with an aim to grow knowledge-based agency, self-direction and the ability for decision making in groups and communities.

In the Aarhus climate action plan for children the overall engagement principle is the connection between climate action and children's well-being: what does sustainability and climate action mean to you, when you are a child; how may you contribute to a better future:

Karen Tambo (Aarhus Municipality), creates engagement in primary school classes, bringing the 'Ready Set Sustainable'-tool for scoping engagement and action based on doing cultural probes with children (methodology)

- "We ask the children what sustainability means to them,"
- "We focus on topics that are part of children's lives – nature, waste, food, transport and recycling,"
- "We use the children's answers throughout the process to make it more recognizable."



# AARHUS MUNICIPALITY - Gør det Samm'n - Do It Together-Climate Actions with Children (3/3)

The municipal climate action plan (2022-24) for children and youth has 6 target areas

- 1) Nature experience and experiment – wilding and biodiversity
- 2) Sustainable and healthy food, co-cooking – reduce food waste and plastics, better packaging
- 3) Reuse, repair, recycle – consume less, re-use more; children and youth collaborate with the department for purchase in the municipality; this is a particular target area for CO2-reduction
- 4) Transportation and mobility (better and safer urban facilities cycling and walking)
- 5) Waste reduction, waste handling / sorting
- 6) Energy – solar energy and energy sustainable buildings (renovation) / solar cells and panels with school buildings are used in science and technology classes; learning from 'our' energy data

These target areas form the basis for climate pedagogy and teaching in primary school (as well as in kindergardens), some are driven by grassroot initiatives while reduction of food waste, waste sorting and fossil-free transportation are decided top-down.

This action plan and the six target areas for children and youth were evaluated (midway) and a report published in Spring 2023





## How to (Create your own Workshop) - (1/4)

First, it's important to clearly understand your problem or area of focus. This means identifying what you want to uncover, defining the problem, and figuring out how to address it. Whether this is done before or after the workshop, it's a crucial part of the design process. Participants also need to have a good grasp of the area they are working with and within.

### Observation

#### How-to ideas for your design:

Encourage participants to observe the area, either in groups or individually.



## How to (Create your own Workshop) - (2/4)

Secondly, after completing their observations, it is important for participants to engage in group discussions about what is at stake and how to create a solution. This discussion should inspire the ideation process, encouraging participants to explore your area, consider potential actions, and understand the key issues involved.

### Verbal

**How-to ideas for your design:**

Encourage participants to talk with each other with or without premade questions



## How to (Create your own Workshop) - (3/4)

Thirdly, after the verbal ideation, encourage participants to generate ideas using analogue methods. This could involve drawing on paper, constructing models with cardboard, or creating a roleplay to visualize how they want the area to be redesigned.

This approach can provide an early understanding of what might work and what might not, and it may also prompt participants to refine their ideas as they revisit the verbal discussion.

### Visual

#### How-to Ideas for Your Design:

Print out pictures of the area and provide a way for participants to draw directly on these images.





## How to (Create your own Workshop) - (4/4)

This final stage of the design process involves digitizing the ideation process. Participants can gain a realistic sense of what their ideas could look like and understand how their work might impact the chosen area. Finally, present your ideas and offer feedback to one another. This exchange will hopefully inspire you to reimagine the area and see it in a new light, with the potential to bring your vision to life.



**Digital**

### How-to Ideas for Your Design:

Utilize an artificial intelligence model to digitize your ideas. This can enhance the ideation process and bring your concepts to life.



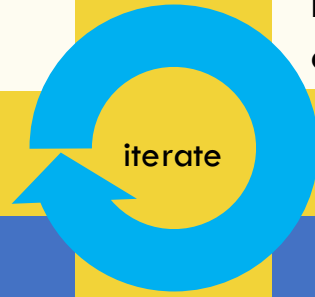
# Young Citizen Engagement (Design Journey: How to)

## 1) Observe the Object

Encourage participants to observe the area, either in groups or individually. This helps participants gather inspiration and develop a sense of connection with the space.

## 2) Analogue Interactions

Provide pictures of the area and provide a way for participants to directly interfere with these images. This tactile approach allows participants to visualise their ideas more concretely and engage creatively.



## 3) Encourage Open Dialogue

Encourage participants to talk with each other, with or without pre-made questions. Facilitating open dialogue fosters idea-sharing and helps participants explore different perspectives.

## 4) AI to Digitize and Ideate

Utilize an artificial intelligence model to digitize your ideas. This can enhance the ideation process by quickly turning concepts into digital models, making them easier to visualise and iterate.

One of the key learnings from conducting workshops was that the iteration process was dependent on the specific workshop, meaning that the results varied from workshop to workshop and from region to region. This indicates that workshops can produce different outcomes depending on the participants, their demographics, and their cultural backgrounds. The figure on the right shows the general tendencies in our design process regarding the workshops.

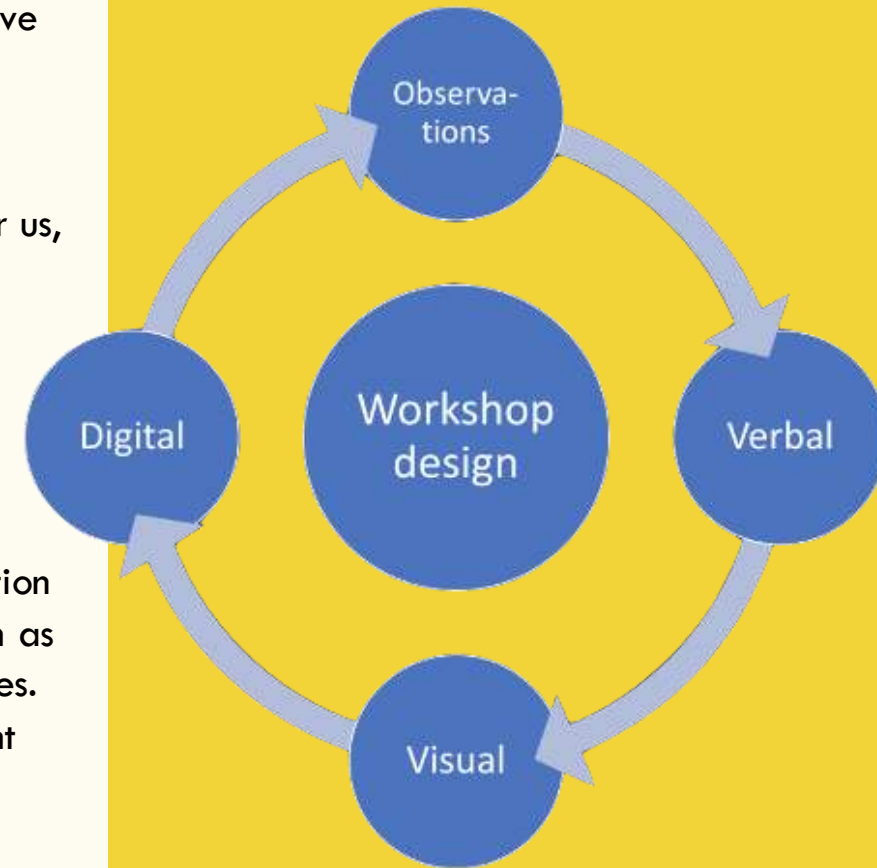
The key takeaways from our work are ownership and responsibility. When rethinking urban spaces, participants achieve better results when they feel ownership of the idea while also being responsible for its development. This means they must ensure their idea is both viable and plausible, while also being creative. This combination leads to stronger outcomes and fosters a deeper connection to the area.

# Learnings from designing and implementing UTJR engagement workshops

Our approach to multimodality in engagement design showed us that playfulness and transitions between different modes—such as drawing, writing, or interacting with digital tools—could feel seamless. This flexibility encourages creativity, allowing participants to move freely between media without rigid structures.

In contrast, a more formal approach to multimodality might proceed in structured sequences, where each stage of the process focuses on one specific medium or technology at a time. For us, this created a more deliberate, step-by-step progression, but it may limit the spontaneous creativity that emerges in a playful setting. However, over time and through iterations, we learned to use both methods to our advantage, creating transregional engagement design.

An example of playful multimodality can be seen in the UrbanistAI workshop "Rethinking Children's Spaces," held at Skødstrup Skole, where 4th-grade students participated in ideation and design activities. The students moved fluidly between different forms of expression, such as drawing and responding to prompts, naturally switching back and forth between these modes. This seamless movement between media exemplifies how a playful approach to engagement design can foster creativity and participation, especially in young learners.





A decorative graphic consisting of a horizontal dotted line that extends across the width of the slide. On the right side, this line turns upwards at a 90-degree angle, forming a partial rectangular frame around the title text.

# **Learnings From our Casework**

# AARHUS - Skødstrup Skole - Rethinking Children's Spaces



The starting point for this workshop was to explore how children can work creatively and productively with Artificial Intelligence through 'UrbanistAI'.

The process leading up to this consisted of a transregional co-designing process which was done through multiple bootcamps with the different partners and co-pilots in Urbantestbed.JR This included Hamburg, Lulåe, Aarhus and DOKK1. This approach was a co-designing-process to the workshop where we, as a transregional team built on our competence for the best approach to the workshop.

The idea of the workshop was to engage young children to think about their surroundings and how to better them to something they wanted. - Our goal for the workshop was to create an understanding of how we as adults can create engagement with children

# AARHUS - Skødstrup Skole - Rethinking Children's Spaces

## AARHUS Skødstrup Skole - UrbanistAi, Rethinking Children's Spaces (2/4)

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The Workshop was structured as shown below

- Before the workshop
  - first the students Selected a relevant location in the city that they would like to 'improve'
  - We, as the hosts, took pictures of the selected places and created 'wondering'-questions that can get the thoughts going regarding the observations.

The workshop was structured into two parts. First a part where the children, on the day revisited their chosen place. And a second part hosted by us in the classroom.

- The Workshop itself consisted of a:
  - introduction to AI with the focus on Lateral Thinking
    - Work in groups of 3 people
      - Select a relevant image + draw and discuss. Draw on the image what you want to see before you start prompting
      - Prompt until you get the images you want
      - Choose the best of your images
      - Prepare a short story about the image
        - every group come forward and shows their AI-generated pictures and presents their reflections regarding this.



Fig. 4 Sample picture

This figure shows the drawings on the laminated pictures before urbanistai.

Location: Skødstrup, Aarhus, Denmark

Date: 18 April 2024

Number of Attendees: 40

Age of Attendees: 9-12

Tools/Media used: Projector / Screen,  
Laminated Pictures, Markers, UrbanistAI

**Our findings** highlighted two key factors in creating engagement: ownership and responsibility for ideas.

Ownership over the process and ideas fosters a connection between the child and the project. This was achieved indirectly through co-structuring and open-ended questions, allowing children to discover answers on their own.

Responsibility is equally crucial. When children generate ideas for local change, they become responsible for bringing those ideas to life. Our workshop encouraged this by giving children ownership and responsibility for their ideas.

Notably, the children continued working on their projects in the following days, driven purely by their interest in improving their space.



# HAMBURG - Using Generative AI for Scenario Building - Young Forum Open City

## HAMBURG Urban Ideation with Children - Young Forum Open City

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### Workshop Outcomes

The attending children were capable of understanding and discussing the need for change to create a more liveable and human friendly environment. They discussed their desires in terms of elements they would like to see and the impact this would have on the environment and how it would be perceived by them. Co-creating on the projected screen by prompting the AI with drawings was very well received and spawned instant debate about the things the group liked and disliked. By adding specific elements and trying different ways of drawing these they came very close to what they envisioned for the space.



Location: Hamburg, Germany

Date: 25 April 2024

Number of Attendees: 5 + 6

Age of Attendees: 11/12

Tools/Media used: Projector / Screen,  
Prints, UrbanistAI



UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future



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The children started with the selection of printed out scenarios they liked and took these as initial prompts to instruct the AI. Finally, the selected theme and characteristic of the selected scenario was imposed onto the real space and an image was created.

As a second step they were asked to improve the prompt by adding a text prompt describing desired changes / objects or things they wanted to avoid.

Finally, a co-creative effort was started where each one of them added an object to the scene by drawing it into the picture which was then taken as a prompt. This effort was specifically well received and they like the co-creational aspect. Which spawned intense debates among the children, very much.

# Gamification in Young Citizen Engagement

The gamification approach adopted for the Save The World application is justified by its potential to revolutionize the educational experience, particularly in engaging students with environmental health and sustainability concepts. Here's why:

**Engagement and Motivation:** Traditional learning methods often struggle to captivate students' attention, especially when it comes to complex topics like environmental health. By gamifying the learning process, Save The World transforms education into an interactive and exciting journey. Through gameplay mechanics, students become active participants in their learning, motivated by the inherent rewards and challenges of the game.

**Contextual Learning:** Save The World doesn't just present information; it immerses players in realistic scenarios where they must apply their knowledge to solve environmental challenges. By traveling across Europe and encountering various pollutants and their effects first hand, students gain a deeper understanding of the subject matter. This contextual learning approach enhances retention and comprehension, as concepts are experienced rather than simply memorized.

**Incentivized Learning:** The integration of mini-games and quests not only makes learning enjoyable but also incentivizes participation. By answering health-related questions and completing challenges, students unlock access to new levels and cities within the game. This gamified progression system encourages regular engagement with the application, ensuring that learning becomes a habitual and enjoyable activity.

**Multilingual Accessibility:** Save The World's availability in six languages ensures that students from diverse linguistic backgrounds can fully participate in the gaming experience. By offering content in multiple languages, the application promotes inclusivity and accessibility, allowing a broader audience to benefit from its educational value.

## Parental Involvement:

Recognizing the importance of parental involvement in a child's learning journey, Save The World provides parents with access rights to answer health questions on behalf of their children. This feature fosters collaboration between parents and children, extending the educational experience beyond the confines of the classroom.

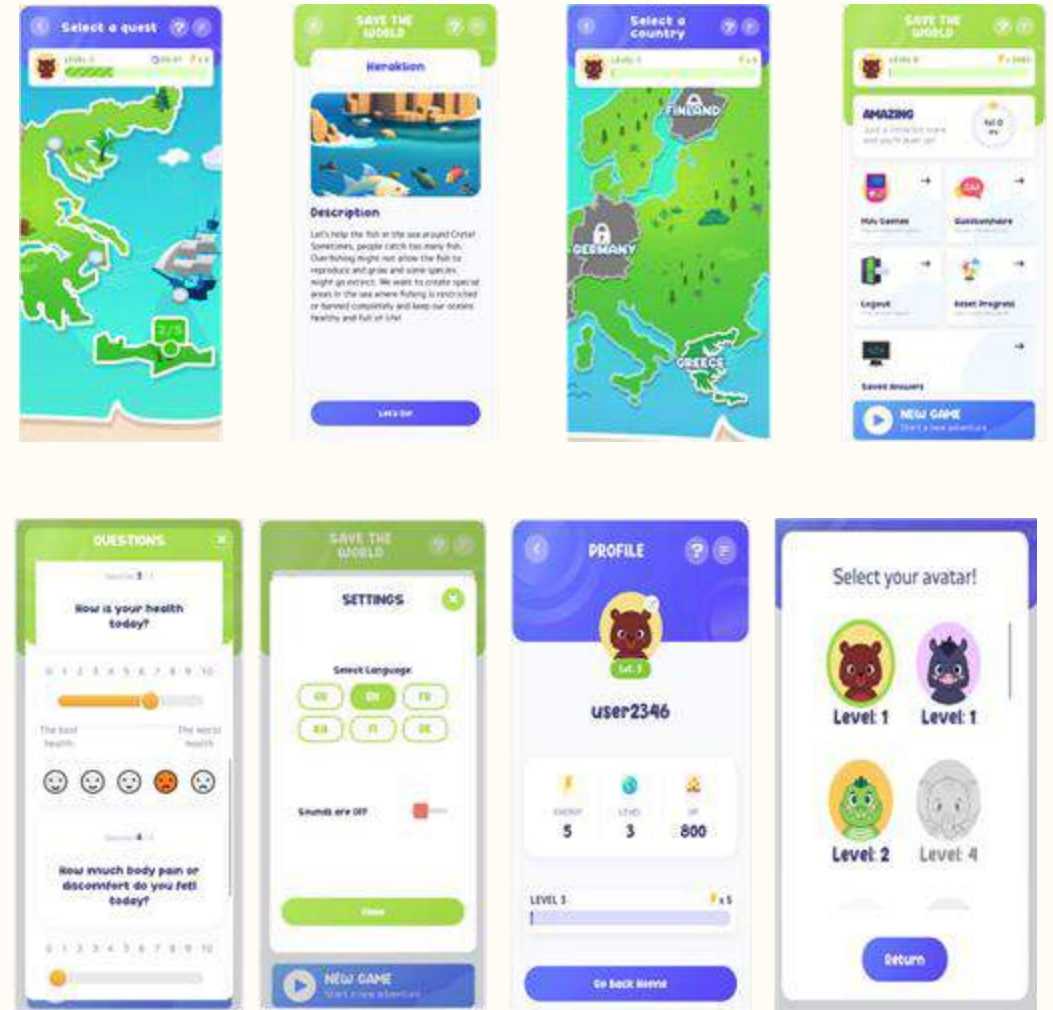
## Scalability and Expansion:

**Scalability and Expansion:** The versatility of Save The World allows for easy scalability and expansion. As new content, countries, and stages are added, the application can continuously evolve to provide fresh learning opportunities. This scalability ensures that Save The World remains relevant and engaging for students over time. Overall, the gamification approach adopted by Save The World fosters critical thinking, problem-solving skills, and a sense of responsibility towards the environment. By merging education with entertainment, Save The World empowers students to become proactive agents of change in creating a healthier and more sustainable future.

# Gamification in Young Citizen Engagement – „Save the World“ game

As a joint activity between SynAir-G and UrbanTestbeds.JR, this use case served to explore the suitability of a gamified approach to engage school children and make them think and discuss about climate and environmental matters.

- The app serves as an educational tool that involves students in environmental health and sustainability.
- Save The World employs gamification to encourage students to learn about the impact of pollutants in Europe, offering a captivating approach to education.
- The application presents real-life environmental challenges through interactive gaming experiences, where players navigate through European cities facing a pollution crisis unique to the city's environment, cultural background, and specific environmental challenges.
- Mini-games within the app require critical thinking and problem-solving skills to combat the adverse effects of pollutants.
- Save The World is designed for a diverse audience, available in six languages, and accessible on mobile devices and computers with parental consent.
- To progress in the game, players must actively learn and answer health-related outcome assessment questions.
- The educational content is seamlessly integrated into the game, providing students with essential environmental facts and insights about the city and the specific challenges it faces.
- The gamified application "Save The World" is being developed to promote participation in the health outcome assessment questionnaire.





# Gamification in Young Citizen Engagement

The feedback from our tests brought to light several areas that require attention, especially considering potential misunderstandings stemming from limited usage. The key issues identified include:

1. **Device Sharing Challenges:** The current setup makes it difficult for multiple children to use the same device seamlessly. This can lead to frustration, especially in a classroom or group setting where shared devices are common.
2. **Questionnaire Confusion:** There was a lack of clarity regarding which questionnaire questions were mandatory. This caused some users to skip important questions, resulting in incomplete data and potential misunderstandings.
3. **Game Orientation Issues:** The games do not adjust properly when switching the phone's orientation, which disrupts the user experience. This limitation is particularly frustrating for children who are used to rotating their devices for different activities.
4. **Help Button Malfunctions:** The help buttons often malfunction, leaving users without support when they encounter difficulties. This can lead to a sense of helplessness, especially for younger children who rely on these features.
5. **Game Instructions:** Instructions for the games were either missing or hard to find. Without clear guidance, children struggled to understand the objectives and rules, hindering their ability to engage with the games fully.
6. **Issues with Saved Progress:** Problems with saving answers and resetting progress were also reported. These issues are particularly concerning as they can lead to lost work and frustration, discouraging continued use of the app.
7. **Profile Visibility and Login Confusion:** There was uncertainty around profile visibility and login status. Users were unsure whether they were logged in or whether their profiles were visible to others, raising concerns about privacy and security.
8. **Persistent Sound Issues:** The app's sound continued to play even when switching to other apps, which is disruptive and can be annoying, particularly in environments where silence is required.
9. **Game Glitches and Freezes:** Various technical glitches and freezes were encountered during gameplay. These issues significantly detract from the user experience and can lead to a loss of interest in the games.



The multimodality in engagement design may – if playful – be seamless, although the formal approach may move in sequences targeting one media or technology.

As the UrbanistAI, Rethinking Children's Spaces-workshop (chap. 4, 9) in Aarhus showed, when ideating and designing the 4th-graders moved seamlessly between drawing, prompting, and back.

# Luleå "Harads City 2.0" @ Teknikens Hus (Science Center) Minecraft Hackathon

In our class, we are 16 students. We divided ourselves into 7 groups with different areas of focus, but we chose to build closer together in the competitive world so that everything is more consolidated and it's easier to help each other.

When you visit our community, it is the year 2085.



## Harads city 2.0

This is our community, Harads City 2.0. Our society is built up of 7 areas: downtown, sports and leisure, service area, industrial area, residential area with schools, rural and agricultural areas, and water and energy.

In Harads City, we construct houses using recycled materials, such as plastic, which was once produced in excessive amounts. Nothing in our city is manufactured using fossil fuels; instead, we build houses from bamboo, natural stone, and invest in new technologies like paper batteries, sustainable energy production from wind, solar, and water, and smart solutions that conserve nature's resources.

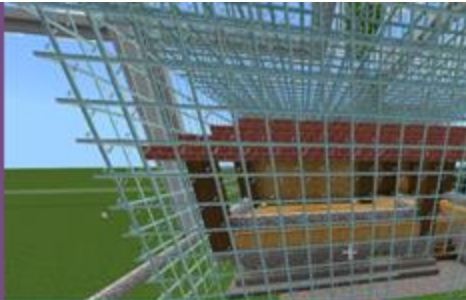
## Innovative solutions

### House in a greenhouse:

The house is heated as the greenhouse warms up from the sun; wastewater fertilizes the crops inside the greenhouse while the water is simultaneously purified and can be reused.

### Innovative school:

A system for collecting and purifying rainwater, solar panels that provide the school with electricity. Large windows that insulate and act as a greenhouse, heating the building.



## Innovative solutions

### Cars of the Future

In our society, cars are powered by biogas and air. We produce biogas ourselves in our biogas plant. Biogas is made from food waste and manure, which are leftover from places like the stable.

The hover cars are powered by a special engine that sucks in and blows out air underneath the vehicle. Since hover cars don't require paved roads, which are not environmentally friendly, they follow white lines painted with eco-friendly sludge paint.



Location: Luleå, Sweden

Date: 2023/2024

Number of Attendees:

Age of Attendees: Grades 5 & 6

Tools/Media used:

Minecraft

## SKOLHACKATHON I MINECRAFT





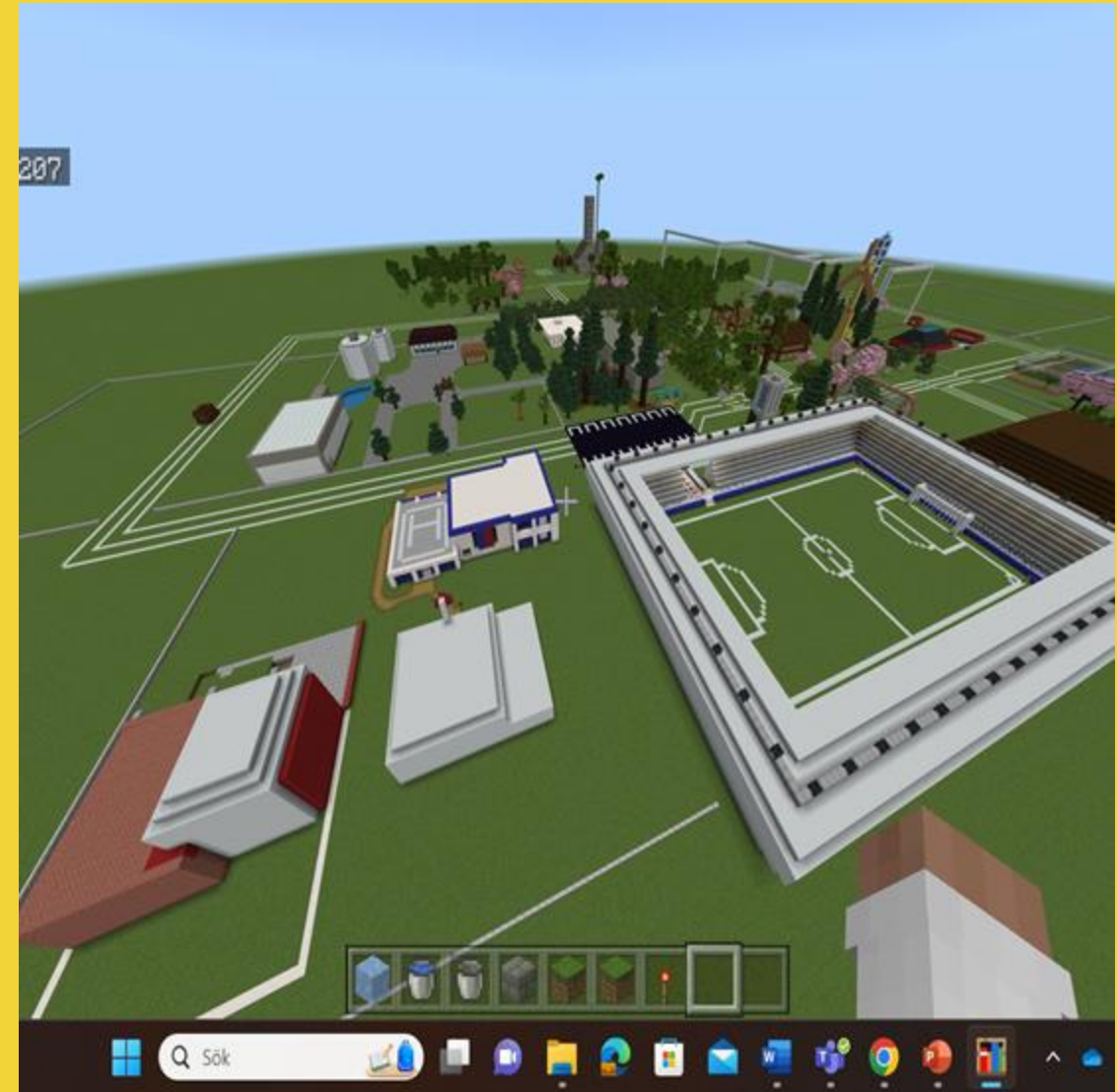
# Gamification in Young Citizen Engagement – Using Minecraft

## Method

- Sandbox game made up of blocks and creatures to build worlds and go on adventures.
- Minecraft serves as a tool for collaboration in hackathons about young citizens' future communities.
- It is an inventive alternative to traditional teaching methods.

## Results

- Minecraft enabled the groups in the hackathon to build a cohesive community in the same world, while each group focuses on a specific area.
- The generated world can be used in workshops run using UrbanistAI. They could be manipulated by and improved by workshop participants using the generative AI capabilities of UrbanistAI.





# Artificial Intelligence

# Artificial intelligence is:

Simple questions  
& Advanced  
scenarios

Generation,  
Prompting &  
Storytelling

Urban data, Insights &  
Understandings

Textual and  
multimedia  
experiments

# Artificial Intelligence - Introduction

Urban development and urban planning are complex multi stakeholder processes which require creativity as well as informed decisions. Recent developments in AI promised new ways of supporting these processes in the realm of developing sustainable urban futures and scenarios.

Following our three-pronged approach AI was utilised in three main steps:

- Explore and understand factual information and data about the environment and space und consideration
- Create ideas and scenarios for a desired urban future
- Shape ideas and and scenarios to fit constraints and requirements (e.g. desired changes like more space for children to play)

For these purposes various approaches to use chat interfaces and feed data into AI tools have been applied to support the exploration of data and information. To create new ideas and shape urban futures a specialised tool, UrbanistAI, which creates images from existing spaces considering desired changes and objects injected by prompting the AI via text, templates or drawings.

Besides AI supported approaches gamification was harnessed to provide an immersive means of creating and exploring urban environments and climate change related issues. Two approaches have been followed:

- Self-developed “Save-the-World” game
- Building a future city with Minecraft

All of the above approaches have been tested with various groups of young citizens. All tools were useful and well received by the children and young adults.

Due to the rapid development of AI technologies we had to change the tools and services used on our way having started with a home-grown AI chatbot we ended up with easy-peasy-ai which provides a very powerful front-end to a wealth of AI functions.

Thus, AI tools and technologies have reached a level of maturity that they provide significant benefit for developing urban futures.

## Table of Content

- Introduction to generative AI in the field of urban ideation
- AI experiments and validation of functional suitability
- Exploration of urban data and interaction with climate plans
- Urban ideation – leveraging generative AI for scenario building and storytelling
- Learning about climate change – “Save the world” game
- Building future scenarios – Minecraft

#Chat Bot  
#Artificial Intelligence  
#Generative AI  
# Gamification



# How we explored AI capabilities and applicability

## Goal of leveraging AI for exploring urban data

Exploring urban data and gaining new insights and understanding from it provides a valuable lever to inspire creativity and build a common ground for debating current sustainability issues and urban futures.

Our approach follows several distinct steps.

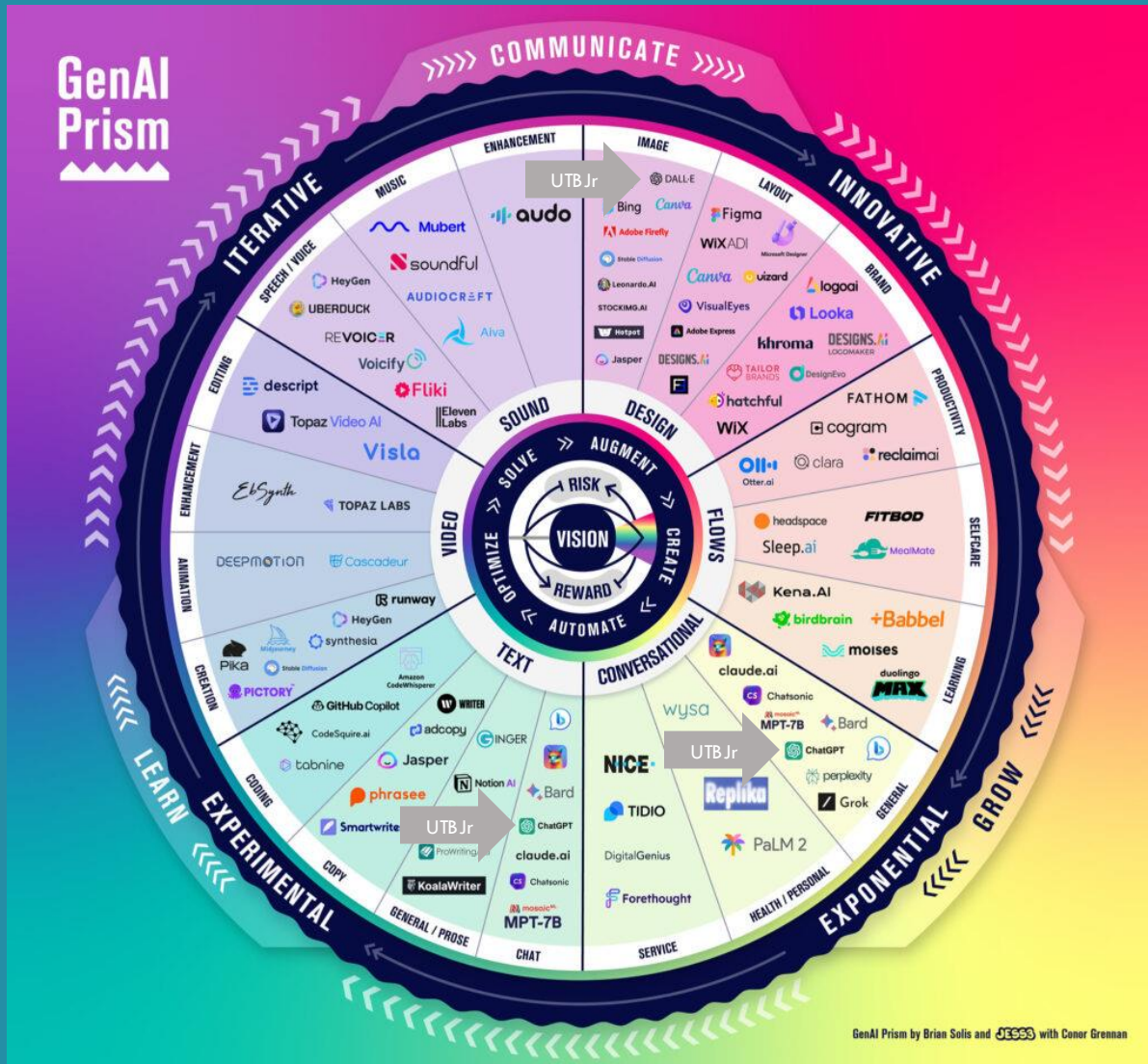
- Explore data sources and collect localised urban data for the cities and places in scope
- Identify and test suitable AI tools to gain new insights from the collected data
- Apply a stepwise methodology to rationalise the possibilities and results starting with simple questions and moving into more advanced scenarios like comparisons and identifying subtle nuances and differences between the avenues taken by the cities

**Large Language Models (LLM)** have become a very promising way to analyse language-based information (i.e. large amounts of text) by semantic search. Generative AI to produce new content induced and controlled by textual and/or multimedia input has also made a big leap recently. We identified a few candidates of which OpenAI's GPT was one of the most promising candidates for our experiments.

However, given the rapid development of AI tools and services we finally used a readily available web service to analyse urban data and neighbourhoods as well as for scenario generation. This would also be our recommendation for teams following our approach since it would help to focus on prompting and storytelling without needing to set up and customise technology from scratch.

The following pages describe our experiences from starting with a toolbox of AI components to leveraging readymade tools and services.

# Generative AI choices and uses – there is a vast number of possibilities



The Generative AI wheel (it is by far not comprehensive) provides a glimpse at the diversity and sheer number of AI tools available. Many of which cover very specialised functions and need to be combined to support a task (e.g. chat interface + image creation). As will be described on the next pages we started with our project during the first availability of OpenAI's ChatGPT.

Since then, AI technology rapidly evolved and new functionalities, better quality services and comprehensive platforms became available.

Our application of AI in workshops and preparation:

- Data Exploration (professional use)
  - Data Retrieval: Home grown API powered software
  - Chatbot: Home grown and Easy Peasy AI
- Learning (workshops)
  - Chatbot: Home grown and Easy Peasy AI
  - Gamification: Save the world game (no AI yet)
- Co-creation (workshops)
  - UrbanistAI
  - Gamification: Minecraft (no AI yet, 09/2024)

# Home-grown AI supported analysis of urban data and climate change information

## Explore

### Explorations:

Query the “Internet”

- specific local information
- general information and approaches

Query specific documents

Compare city’s approaches

Apply specific perspectives (12y olds)

Combine all of the above

### Technology:

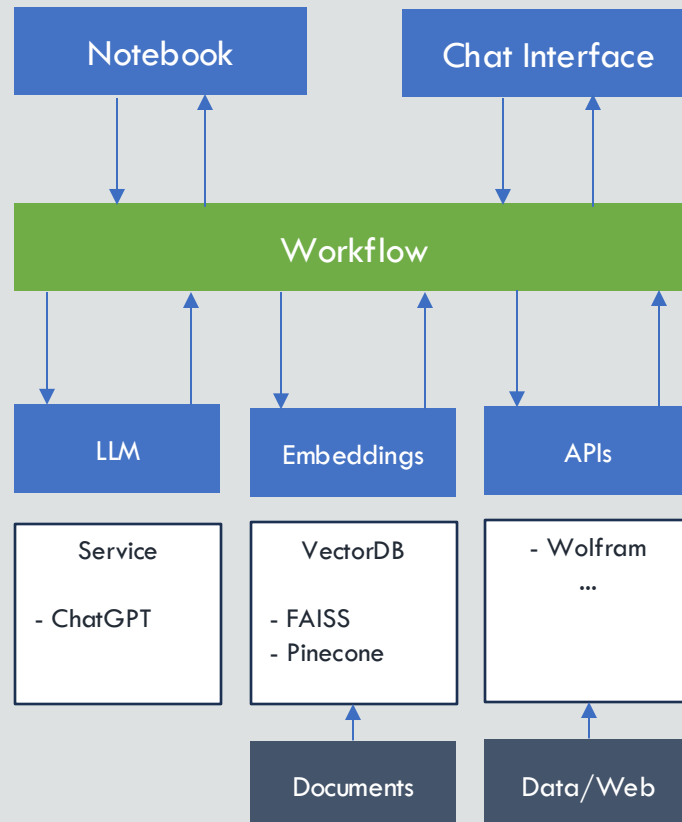
ChatGPT plain

ChatGPT + Vector DB

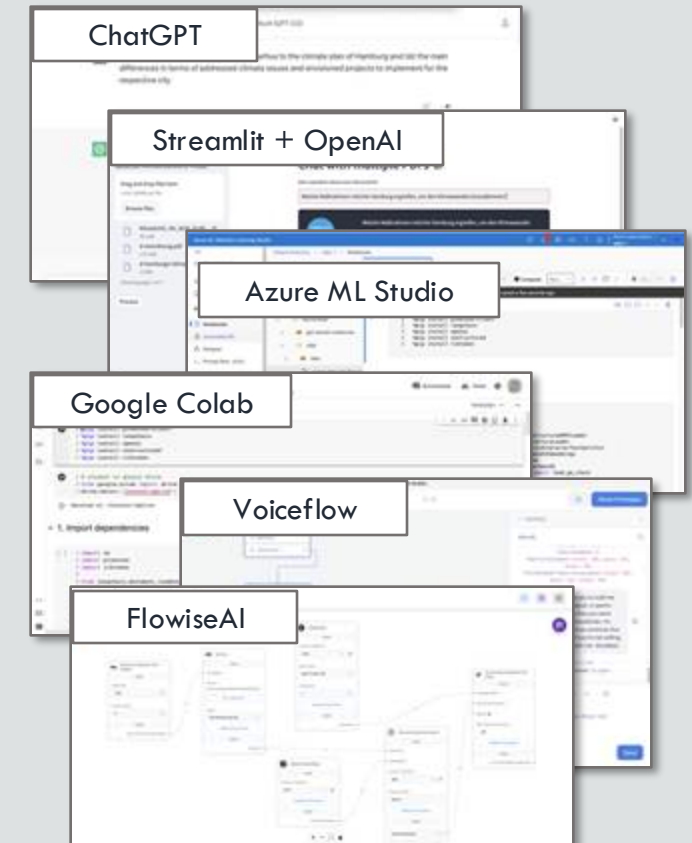
Integrated ChatBot Solution

Chaining of LLM + API services

## Build



## Apply





# We conducted several tests to validate the suitability of LLMs for our purposes

To validate the technology against our goals of deepening the understanding of urban data and information from climate plans and other related documents we conducted a couple of experiments utilizing the technical architecture described on the previous page. These revealed that the information extracted from the documents was correct and a sufficient answer to the question was given. However, comparing cities and best practices was mostly impossible so we did not pursue this path.

Experiment 1 - Set Up

Procedure

Text documents from cities like climate plans were taken and fed into a vector DB as chunks to be matched with questions.

Technology

Environment 1 (local application using Streamlit):

- LLM: Open AI GPT

These questions

- If the LLM finds matching information
- If the LLM has enough information to answer the question
- If the answer is correct

Experiment 1 – Simple questions against climate plans and related documents from one city

General Information

Experiment Code/No.: HCU-001-Experiment1

Research question

Simple questions against climate plans and related documents from one city

Experiment 1 – Technical and data details

Data / Documents

Erste Fortschreibung Hamburger Klimaplan (2019) + Anlagen:

- d-anlage-1-uebersicht-ueber-klimaanpassungen-2015-2019.pdf
- d-anlage-2-massnahmenprogramm-transformationsschritte-waermeverwendung-inkl-gebaeudeeffizienz.pdf
- d-anlage-3-massnahmenprogramm-transformationsschritte-mobilitaetswende.pdf
- d-anlage-4-massnahmenprogramm-transformationsschritte-wirtschaft.pdf
- d-anlage-5-massnahmenprogramm-transformationsschritte-klimaanpassung.pdf
- d-hamburger-klimaplan-2019.pdf

Szenarienentwicklung Klimaziele Hamburg + Anlagen:

- d-szenarien-co2budget.pdf
- d-szenarien-ergebnisab.pdf
- d-szenarien-klimaneutralitaetsbilanzierung.pdf
- d-szenarien-klimawarthaeklimacheck.pdf
- d-szenarien-szenarioa.pdf
- d-szenarien-szenariob.pdf

Technology

Environment 1 (local application using Streamlit):

- LLM: Open AI GPT
- vector store: FAISS
- Framework: langchain

Requirements:

- langchain==0.0.184
- PyPDF2==3.0.1
- python-dotenv==1.0.0
- streamlit==1.18.1
- openai==0.27.6
- faiss-cpu==1.7.4

LLM parameters:

- model\_name="gpt-3.5-turbo", temperature=0.8

Experiment 1 – Sample result

Question

What projects and measures are planned in Hamburg's climate initiatives to protect and expand urban green spaces and plantings such as street trees?

Answer

Hamburg's climate initiatives include various projects and measures to protect and expand urban green spaces and plantings such as street trees.


- In a decade, 100 hectares of green roofs are to be built in order to create a new green infrastructure on the roofs.
- There is a green facade strategy to encourage the construction of more green walls.
- The preservation and development of tree populations, especially old urban trees, is important. All districts should designate areas for reforestation and rewetting of peatlands.
- New knowledge about the importance of trees for open space planning is to be developed in order to draw conclusions for Hamburg's urban greenery.
- In the Open Space Quality Offensive, inner-city building space potential is used to upgrade and create open spaces in the district. New parks and green spaces are being created.
- There is a group of experts in collaboration with the Hamburg Chamber of Crafts that implements area-specific structural requirements and conversions as part of climate adaptation.

These projects and measures are intended to help protect and expand urban green spaces and plantings in order to improve the quality of life in neighborhoods and adapt to climate change.


UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future

Interreg

Baltic Sea Region



Co-funded by  
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RESILIENT ECONOMIES AND COMMUNITIES  
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# Overview of experiments and steps taken to validate LLM's suitability

In general, our experiments provide a chat or text input which allows to ask a question as well as providing specific instructions (prompts) for the behaviour of the LLM and expected answer as well as example question and answer pairs.

1. Simple questions against climate plans and related documents from **one city**

- without custom prompt (e.g. role of LLM)

This includes some experimentation with technical parameters like chunk size for embeddings as well as pre-processing of the documents.

2. Simple questions against climate plans and related documents from **one city**

- with custom prompt (e.g. role of LLM)

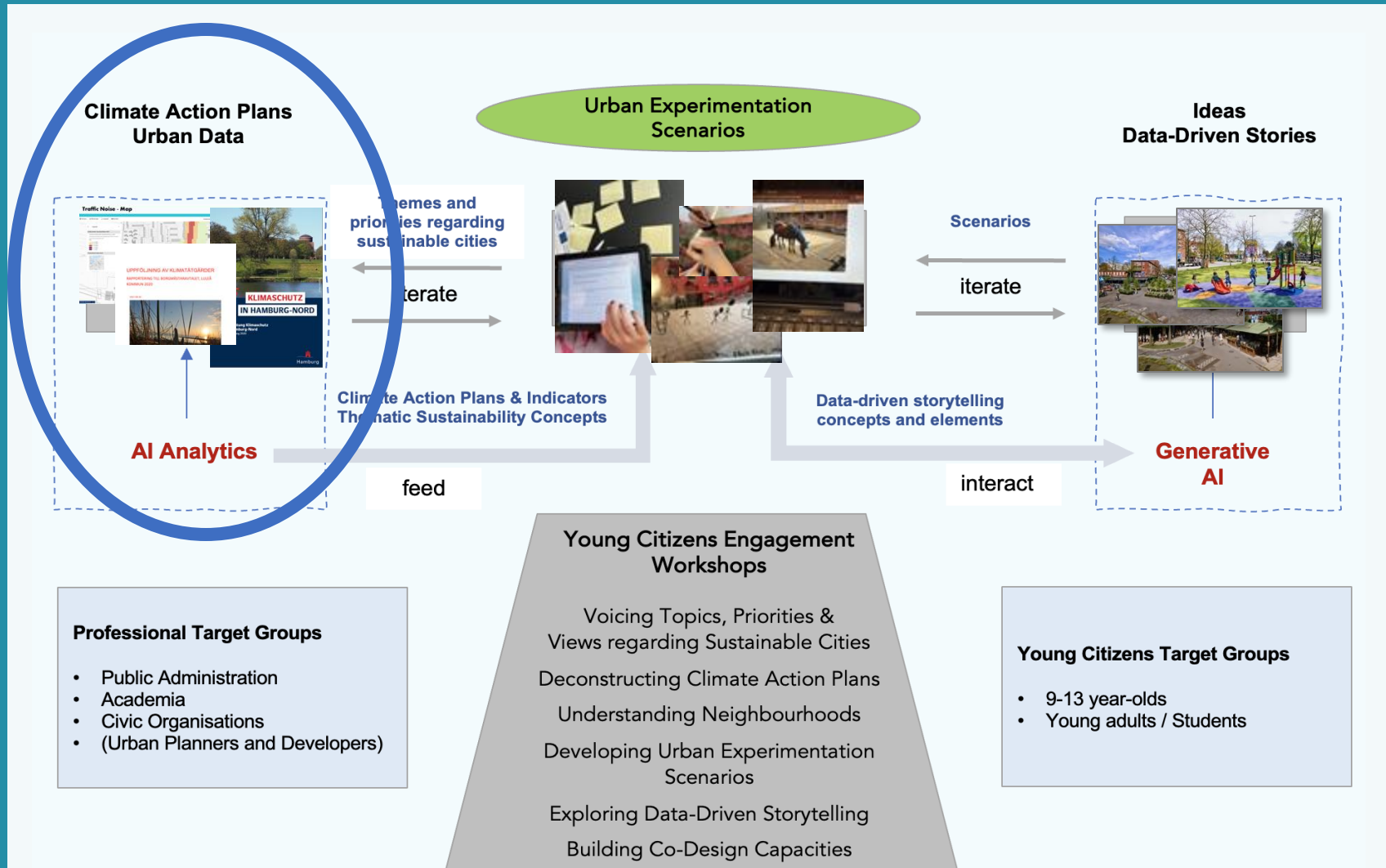
3. Simple questions against climate plans and related documents from **more than one city**

- with and without custom prompt (e.g. role of LLM)

Specific question: Can we enable the LLM to distinguish between cities if the information is stored in one vector store?

4. **Comparing situations** in different cities, i.e. what does one city do the other does not?
5. Can we put the LLM into the **shoes of a young citizen** (e.g. 12-year-old pupils) and provide adequate answers?
6. Finding **best practices for specific challenges** for urban environments caused by climate change and match these to local urban data (e.g. assess fit of solution for a specific urban environment)

# AI supporting urban insights by making data accessible and comprehensible



Our conceptual model involves urban data and climate plans to create a springboard for co-creational scenario building.

At the beginning of the process, many documents and data had to be assessed to understand the starting point and what the status quo of a selected environment (quarter, city, neighbourhood) is to comprehend the possibilities and priorities for future action.

We experimented with a few tools and finally decided to leverage easy-peasy-ai as our front end and framework to utilize different LLMs and prompting to explore the information available.

Easy-peasy-ai allowed us to select LLMs among the market leading vendors and to have access to the latest versions of each vendor once they became available.

Additionally, we experimented with tools like transcription and speech-to-text functionality which helped us to capture some results from workshops and presentations more efficiently.



# Exploring data and information to understand climate issues utilizing AI

## Goal of leveraging Generative AI for understanding climate change related issues and perspectives

To help professionals and children to understand the implications of climate change, identify potential measures to be taken and the explicit consequences for their neighbourhood we wanted to leverage the capabilities of LLMs in this area.

Some key challenges with LLMs (at least when we started to work with them) were that their output was somehow hard to predict and that they could only build on the „knowledge“ they had gained when they had been initially trained. This did not deliver sufficient results but fortunately soon embeddings retrieved from a vector DB could be utilized to feed current and domain specific knowledge into these models. Having started with a home-grown approach during the course of the project integrated multifunctional AI solutions became available at a reasonable cost. We tested a few of them and ended up using easy-peasy-ai as our main tool for chat and document embedding, discontinuing our initial home-grown approach.

During the course of the project, we occasionally tried more LLM services and models as well as tools to leverage these advanced models rapidly. For example, OpenAI introduced ChatGPT-4o and competitors like Anthropic, Meta and Google released new versions of their LLMs alongside new derivatives specialising in certain areas like coding or chemistry.

Very recently the comparison of documents and climate plans, e.g. comparing the climate goals from a first revision climate action plan with its second revision became possible with Google's notebook LM introduced in September 2024.

# Chatting with climate plans to understand climate related issues – Luleå & Aarhus

## LULEÅ – Save the World game and chat bot exploration of climate plans

3



**Goals**  
Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the



UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable

## AARHUS – Save the World game and chat bot exploration of climate plans

4



**Goals**  
Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

### Methods

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues

UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future



In this workshop, we had the children test our home-grown chatbot and had them play the “Save the World” game.

- We gave the children a brief explanation of climate change
- We then gave them 15 minutes to test the chatbot
- We were able to discern what topics they were interested to learn about
- We were able to identify false answers from the chatbot

# The tool we used for the chat exploration – Easy-Peasy.AI

Easy-Peasy.AI is a versatile AI content creation tool designed to assist users with a wide range of writing tasks. We used the chatbot functionality which offers:

**Conversational AI:** The platform includes intelligent chatbots that can engage users in natural, dynamic conversations, mimicking human-like interactions.

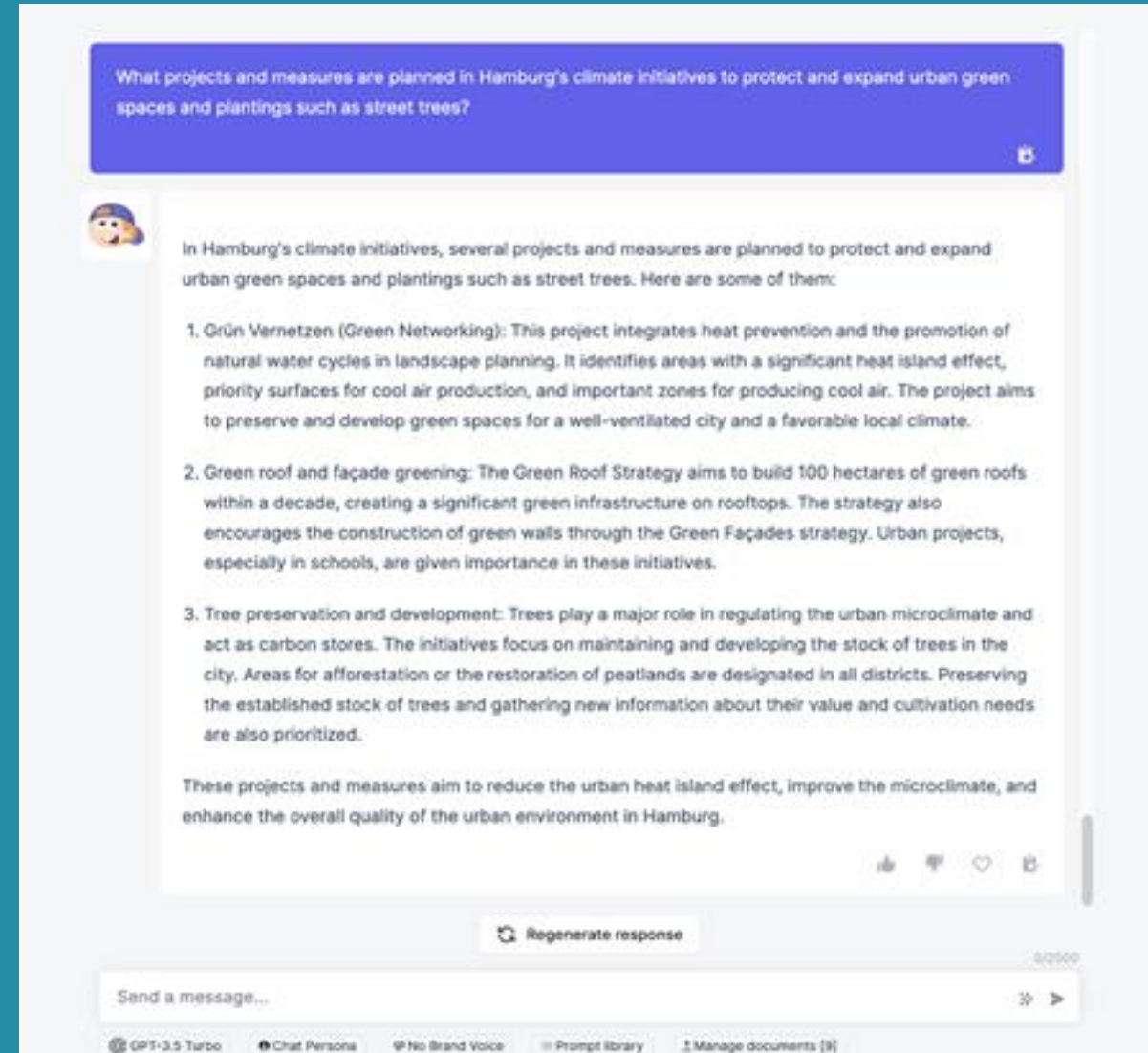
**Context Awareness:** These chatbots maintain context throughout conversations, allowing them to provide relevant responses and follow-up questions based on previous interactions.

**Chat with Documents:** The chat bot can retrieve information from documents provided by the user.

**Customizable Responses:** Users can tailor chatbot responses to fit specific brand tones or contexts, enhancing user experience (e.g. by setting a persona for the chat bot).

It offers several generative AI tools, e.g., ChatGPT, Claude, Mextral, Meta Llama, and Google Gemini pro from which the user can choose as needed.

- It was launched halfway through the development of the home-grown chatbot. It provided all the features that was needed for the use cases, including ChatGPT API, using documents as knowledge source, and having the ability to create personas.
- Chat engine: ChatGPT 3.5 Turbo was used (4.x was not available then)
- Data sources: climate change plans from Aarhus, Hamburg, and Luleå
- Chat persona: “Climater” - A climate change specialist explaining climate change plans to children





# Home-grown chatbot test results from Luleå and Aarhus workshop

Questions – Luleå	Answer Type	Answer Language	Category
Why has it become warmer in the world?	Links	English	Temperature
How did the global goals come about?	Answered	Swedish	Goals
Can we trust you?	Answered + links	Swedish	Usability
Why does plastic accumulate in the sea at the coast?	Answered	English	Plastic
How much plastic ends up in the forest per year?	Links	English	Plastic
How much plastic ends up in the ocean per year?	Links	English	Plastic

Questions - Aarhus	Answer Type	Answer Language	Category
How much warmer does it get in a year?	Couldn't answer	Danish	Temperature
Which year will it be the warmest?	Couldn't answer	Danish	Temperature
How much warmer does it get per year in Denmark?	Partial answer	Danish	Temperature
When is it too late to stop the change?	Answered	Danish	Actions
How cold is it in Denmark	Couldn't answer	English	Temperature
What can you as an individual do to stop climate change?	Answered	Danish	Actions
How worse has the climate become in the past 5 years?	Answered	Danish	General
How much warmer has it become in Denmark in the past 5 years?	Couldn't answer	Danish	Temperature
Has there been fewer people due to climate change?	Answered	English	Population
Why has it become warmer in the world?	Links	English	Temperature

## Luleå - Results

- The chatbot gave weblinks instead of answers when it couldn't answer.
- If someone asked a question in Swedish, sometimes the chatbot answered in English.
- The children transitioned from asking general questions about climate change to asking about plastic waste.

## Aarhus - Results

- The chatbot replied with "I don't know" when it couldn't find the response in the climate change plans.
- If someone asked a question in Danish, sometimes the chatbot answered in English.
- The children transitioned from asking general questions about climate change to asking about personal responsibility to stop it.

# Overall chatbot results

The chatbot was able to answer most questions, however, some of the questions were answered in English instead of the user's language and some questions were answered with a list of links instead of answering these directly from the climate change plans documents.

More reliable sources about climate change and climate change plans need to be provided. In some of the smaller cities like Luleå, using municipality or nationwide climate change plans might provide more information.

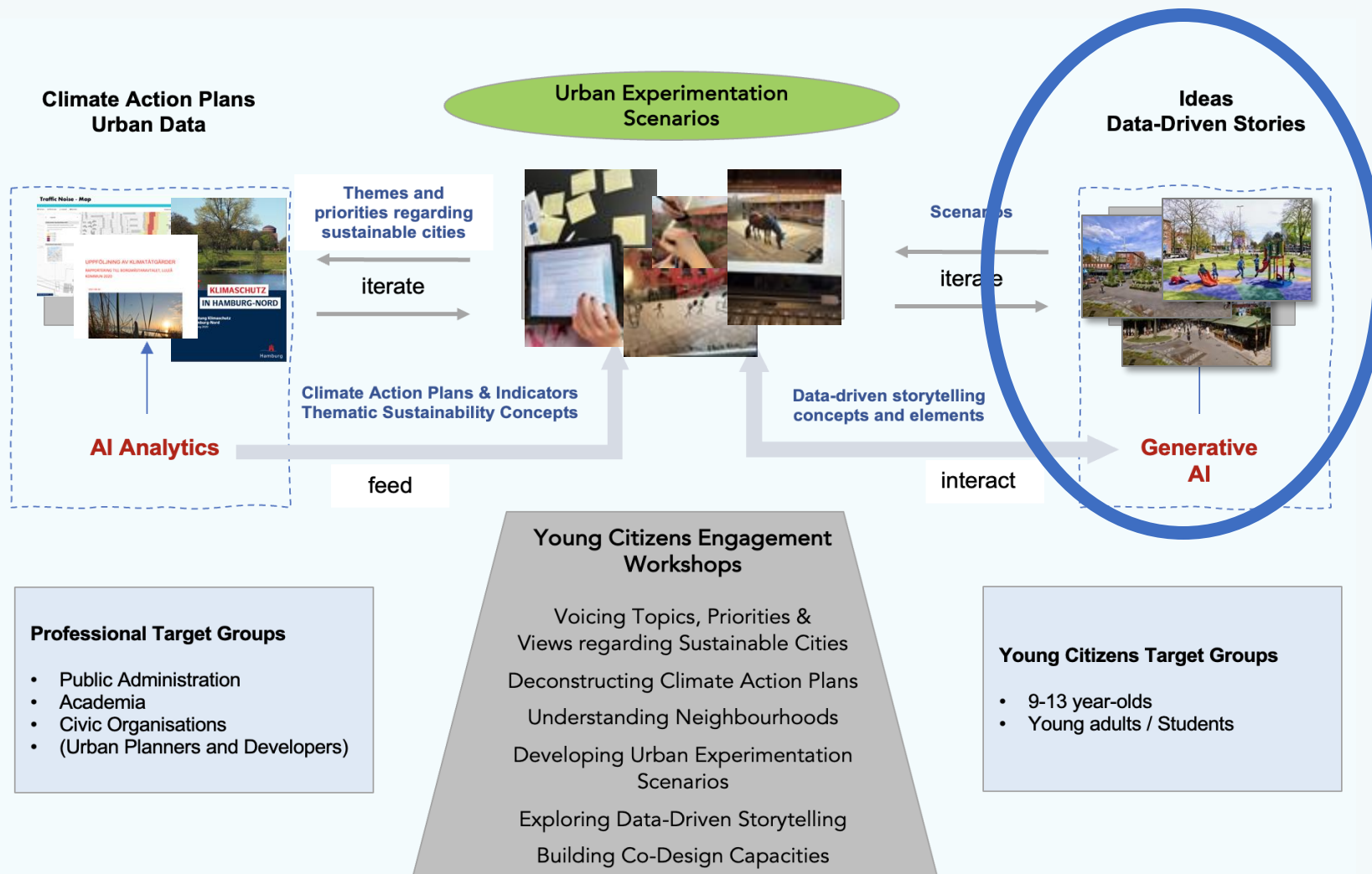
The kids were able to engage with climate change plans to learn basics about climate change, their role, and the climate change plans of their city/country.

The workshop conductors were able to engage kids with climate change plans from reliable sources.

## Conclusion:

In workshops for climate focused urban planning, the chatbot can be used as a tool for kids to interact with climate change plans from their cities/countries. The LLM tool can be training to use climate change plans documents. If the kids have questions about climate change or climate change plans in their city/country, they could directly ask the documents and use that knowledge during the co-design workshop.

# AI supporting urban futures creation opens new perspectives and possibilities



At the creational end of our conceptual model the co-creational scenario building was supported by UrbanistAI, a GPT (Generative Pretrained Transformer) model to create pictures of a desired urban future.

UrbanistAI is capable of taking text, hand drawn pictures and photos as an input. Additionally, the created images can be augmented by predefined objects (e.g. bench) or hand drawn objects.

This opens a wide area of application from a more wholistic abstract approach with little input and somehow unpredictable results to a more fine-grained modifications of the scenario which considers constraints and puts focus on very specific and granular changes.

So UrbanistAI supports different pathways towards urban futures from a more open and “unpredictable” approach to a more constrained and focused way of creating scenarios.



# AI supported generation of urban futures

## Goal of leveraging Generative AI for creating urban futures

Once the situation and goals for a neighbourhood have been analysed, objectives have been set and stakeholders identified exploring future scenarios for a sustainable environment can start. Traditionally this required architects and designers to capture the ideas and requirements from urban planners, real estate developers, citizens and other stakeholders to define and visualise future scenarios reflecting their goals and requirements.

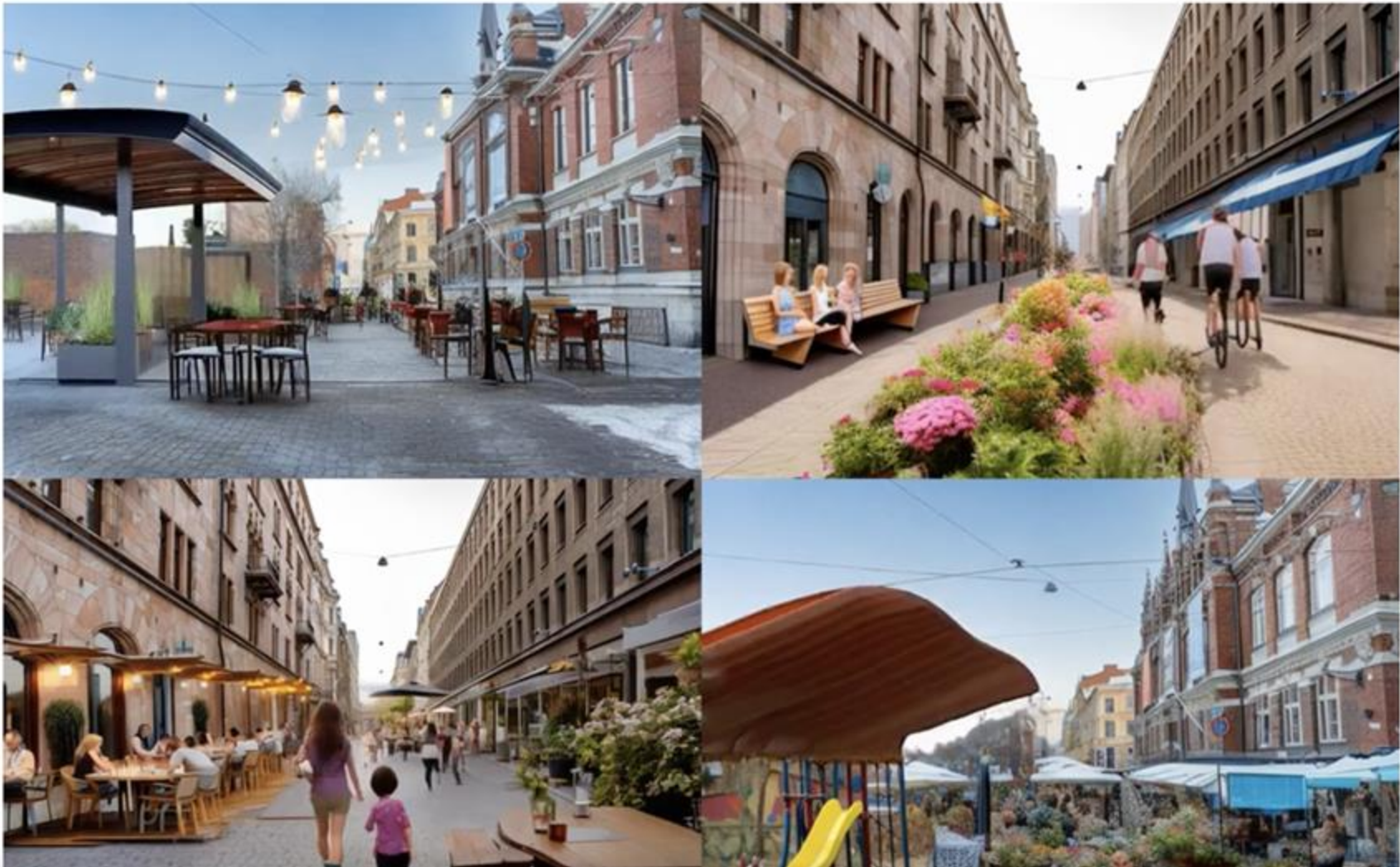
Generative AI opens a new way to approach the co-creation of future scenarios especially when the imaginative and storytelling aspect is required, and technical and physical accuracy is not a priority (although there are some tools which already address this challenge). We started experimenting with tools like DALL·E and Stable Diffusion to create imaginative futures from scratch. These were lacking the current context of the selected neighbourhoods and thus were nice to look at but had no connection to the existing real place.

Fortunately, we came across UrbanistAI, a tool to create places based on real world input, meaning pictures from the current urban environment. Based on these images are created by instructing the tool with what one wants to see and what not. Feeding the tool with the images and the desired qualities and objects of the future scenario UrbanistAI generates a modified image with the requested qualities and objects. Since generative AI can be very “creative” these results can be quite realistic and reflect the requesters ultimate desires, but it can also lead to less useful results. This can be influenced by the prompting as well as the selection of the areas in the image which shall be altered. The whole process can be repeated, and only smaller sections of the image can be altered in an iterative manner which allows to create more specific results.

However, since the tool and process are still in the early stage of AI generated urban scenarios, it requires some experience and knowledge to create appealing results.

# Generative AI for Scenarios and Storytelling

UrbanistAI is a generative AI platform for participatory planning and co-design.



## Prompting Generative AI Scenarios





# UrbanistAI – A tool to generate urban future scenarios

## Method

The method requires an input as a starting point. This usually is an image of an existing urban space but can also be purely imaginative. Text and images can be used to “prompt” the system. So, it is important to define how far it is desired to refer to the current environment or provide more freedom in creating a future scenario.

## Example Results

Using the most convenient way to generate a scenario involves providing an image of the space under consideration, a selection of the function of the space and amenities or other objects/qualities one would like to see.



Location: Hamburg Kirchsteinbek

Prompt: a small urban green space with people playing chess



Location: Hamburg Rothenburgsort

Prompt: a dense urban forest providing shade and natural cooling with a market



“Urban Ideation” - UrbanistAI provides multiple frontends for participation

**UrbanistAI** GenAI platform for participatory design

Desktop

Complete suit of UrbanistAI tools + Project management.


iPad

Magic drawing and rendering



Mobile

Map-based online ideation and participation

  
  
Map-based ideation collection



# UrbanistAI Workshops – Creating urban futures with AI

**AARHUS - Skødstrup Skole - Rethinking Children's Spaces**
10



The starting point for this workshop was to explore how children can work creatively and productively with Artificial Intelligence through 'UrbanistAI'.

The process leading up to this consisted of a transregional co-designing process which was done through multiple bootcamps with the different partners and co-pilots in UrbanTestbeds.JR. This included Hamburg, Lübeck, Aarhus and DOKKI. This approach was a co-designing process to the workshop where we, as a transregional team built on our competence for the best approach to the workshop.

The idea of the workshop was to engage young children to think about their surroundings and how to better them to something they wanted. Our goal for the workshop was to create an understanding of how we as adults can create engagement with children.


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**HAMBURG Urban Ideation with Children - Young Forum Open City**
7

**Workshop Planning and Materials**  
Starting with an ideation canvas we created a workshop outline, setting the goals, the theme as well as challenges and opportunities to involve the targeted stakeholders and participants. The workshop was structured in four main parts:

1. Understanding the need for change in the urban environment
2. Getting familiar with the spaces under consideration
3. Co-Creating scenarios leveraging the tool urbanistAI
4. Discussing changes and anticipating impact on liveability

**Location:** Hamburg, Germany  
**Date:** 25 April 2024  
**Number of Attendees:** 5 + 6  
**Age of Attendees:** 11/12

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI



**A - WORKSHOP IDEATION -**


GENERAL INFORMATION: The workshop was part of the UrbanTestbeds.JR project, which aims to engage young citizens in the co-design of sustainable urban futures. The workshop was held in Hamburg, Germany, on April 25, 2024. The participants were 11-12 year old children. The workshop was structured in four main parts: 1. Understanding the need for change in the urban environment, 2. Getting familiar with the spaces under consideration, 3. Co-Creating scenarios leveraging the tool urbanistAI, and 4. Discussing changes and anticipating impact on liveability.

THEME: The theme of the workshop was 'Urban Ideation with Children - Young Forum Open City'. The goal was to engage young children in the co-design of sustainable urban futures.

TIME HORIZON: The workshop was held over a period of 2 hours.

RESULTS/OUTCOMES: The workshop resulted in the co-creation of several urban scenarios, which were then used to prompt the UrbanistAI tool. The children also discussed the challenges and opportunities of the urban environment.

LESSONS LEARNED: The workshop was a success in engaging young children in the co-design of sustainable urban futures. The children were able to understand the need for change in the urban environment and to co-create scenarios that leveraged the UrbanistAI tool. The workshop also provided a hands-on experience for the children in using the UrbanistAI tool.


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**HAMBURG "Our Digital Neighbourhood" @ Central Library Hamburg – Part 2**
11



**Location:** Hamburg, Germany  
**Date:** 05 July 2024  
**Number of Attendees:** 22  
**Age of Attendees:** 9-10

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI


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**HAMBURG Explore AI for urban development@ Central Library Hamburg**
13



**Location:** Hamburg, Germany  
**Date:** 10 September, 2024  
**Number of Attendees:** 30  
**Age of Attendees:** 16-17

**Tools/Media used:** Projector / Screen, UrbanistAI

This workshop was embedded into an AI education session for a school class. Starting with general information about AI and its application in various fields as well as ethical and bias issues we used UrbanistAI to provide a hands on experience for the students. They explored three different ways of prompting the AI:

- templates/pictures as selection
- text prompts
- drawings by hand enriched by text prompts


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We utilised urbanistAI in different ways (text, image, drawing) exploiting the different capabilities of the tool and experimenting with different group set ups (small to whole class collaboration).

In use case #10 we looked at a distinct inner space of a school in Aarhus. Here the children (9-12 y) were offered the opportunity to draw desired objects into the pictures of their school yard. Use case #7 we let the children (11-12 y) preselect desired scenarios from printed pictures which were then taken to prompt urbanistAI. This allowed another easy entry into prompting and produced highly appreciated results.

For use case #11 we also used the drawing interface in groups so that the children (9-10 y) had to collaborate on creating the desired objects. This induced emotional and tense debates amongst the children and led to group decisions upon the composition of the images.

Use case #13 engaged a different age group (16-17 y) and we explored all three methods to prompt the tool: images, text and drawing. All of which were seen as a viable alternative by the students.



# „Save the World“ game - Gamification for learning

As a joint activity between SynAir-G and UrbanTestbeds.JR, this use case served to explore the suitability of a gamified approach to engage school children and make them think and discuss about climate and environmental matters.

- The app serves as an educational tool that involves students in environmental health and sustainability.
- Save The World employs gamification to encourage students to learn about the impact of pollutants in Europe, offering a captivating approach to education.
- The application presents real-life environmental challenges through interactive gaming experiences, where players navigate through European cities facing a pollution crisis unique to the city's environment, cultural background, and specific environmental challenges.
- Mini-games within the app require critical thinking and problem-solving skills to combat the adverse effects of pollutants.
- Save The World is designed for a diverse audience, available in six languages, and accessible on mobile devices and computers with parental consent.
- To progress in the game, players must actively learn and answer health-related outcome assessment questions.
- The educational content is seamlessly integrated into the game, providing students with essential environmental facts and insights about the city and the specific challenges it faces.
- The gamified application "Save The World" is being developed to promote participation in the health outcome assessment questionnaire.

**LULEÅ – Research Friday - Teknikens Hus (1/3)** **3**

**Workshop Goals**  
Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.


**Workshop Description**  
This workshop was organised around two topics:

1) Learning about climate change through chatting with an LLM  
The children were introduced to the home-grown chatbot which was preloaded with documents regarding climate change mitigation strategies and plans from Luleå/Sweden. They could raise their questions and get into a dialogue with the chatbot

2) Learning about climate change by helping to improve a game dealing with climate change issues  
The children were asked to play a game on a tablet and provide feedback regarding errors and potential areas for improvement for the game. Since the game was still under construction there were some obvious errors but also the usability and fun to play were considered as areas to be considered for improvement.

**Location:** Luleå, Sweden  
**Date:** 29 September 2023  
**Number of Attendees:** 28  
**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Home-grown, Tablet Game



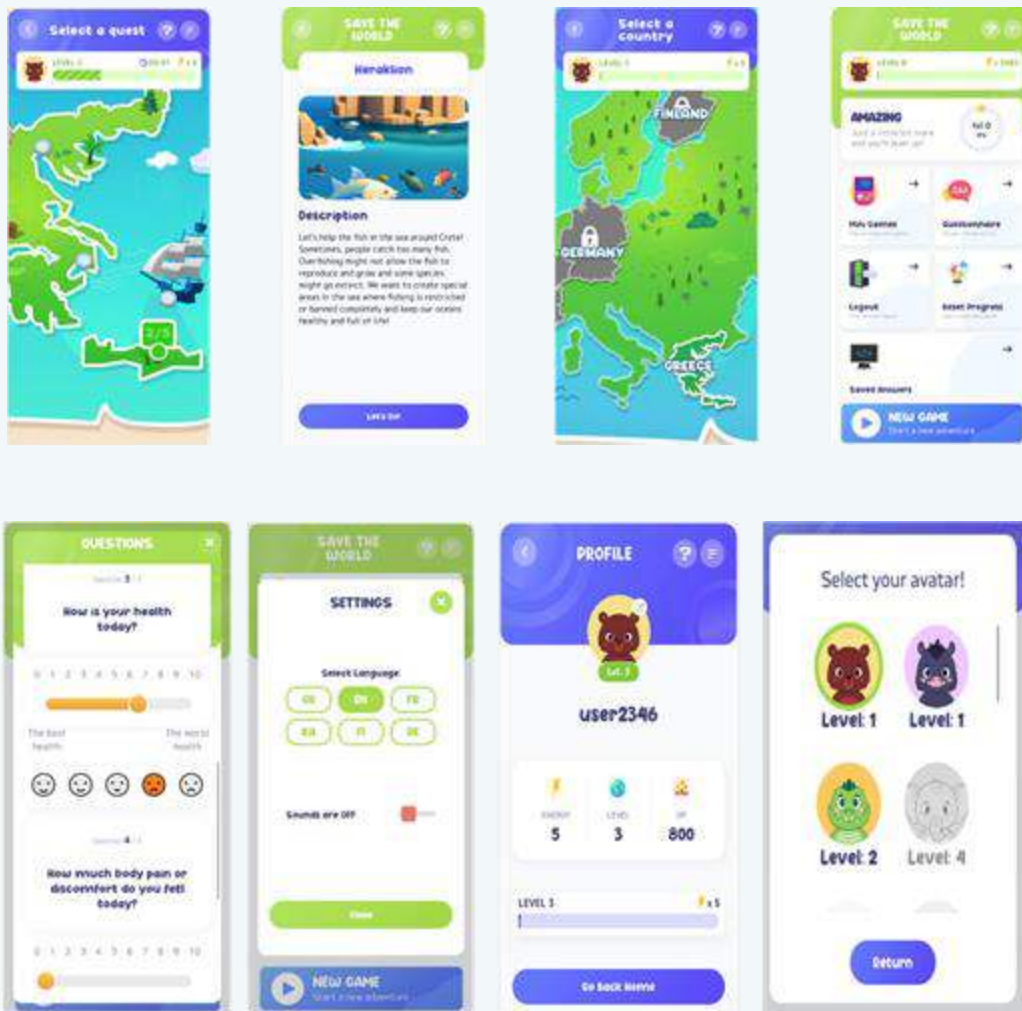
UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future

Interreg Baltic Sea Region Co-funded by the European Union  
UrbanTestbeds.JR

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# “Save the world” game results



Besides the experience of dealing with climate related matters we asked the children to provide feedback regarding the game including usability of the tool.

The feedback from the tests highlighted several areas for improvement, acknowledging potential misunderstandings due to limited usage:

- Inability for multiple kids to use the same device seamlessly.
- Lack of clarity on mandatory questionnaire questions.
- Non-adjustable games when switching phone orientation.
- Malfunctioning help buttons.
- Missing or hard-to-find game instructions.
- Issues with saved answers and progress reset functions.
- Unclear profile visibility and login status.
- Persistent sound despite app switching.
- Various game glitches and freezes.

Recommendations included refining user account management, clarifying questionnaire requirements, enhancing game adjustability and help features, fixing bugs related to saved progress and sound control, and ensuring smoother gameplay experiences.

# Gamification for co-creation – using Minecraft

Minecraft provides a complex game for creating virtual environments (open-world-game) initially invented by an independent developer from Sweden, now owned by Microsoft. The education version we used was released later and targets education audiences who are offered various base line „worlds“ or „scenarios“. These „worlds“ are tailored to address specific educational goals like learning about climate change, urbanisation and related technologies (and many more).

## Method

- Sandbox game made up of blocks and creatures to build worlds and go on adventures.
- Minecraft serves as a tool for collaboration in hackathons about young citizens' future communities.
- It is an inventive alternative to traditional teaching methods.

## Results

- Minecraft enabled the groups in the hackathon to build a cohesive community in the same world, while each group focuses on a specific area of the jointly inhabited world.
- As a future enhancement the generated world could be used in workshops using UrbanistAI. Images could be fed into UrbanistAI manipulated and improved by workshop participants using the generative AI capabilities of UrbanistAI. These could then be applied in the game to change the virtual worlds based on the collaboratively developed urban future.





# Minecraft offers an immersive experience to facilitate discussions about climate issues

## LULEÅ "Harads City 2.0" @ Teknikens Hus (Science Center) Minecraft Hackathon

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In our class, we are 16 students. We divided ourselves into 7 groups with different areas of focus, but we chose to build closer together in the competitive world so that everything is more consolidated and it's easier to help each other.

When you visit our community, it is the year 2085.

### Innovative solutions

#### House in a greenhouse:

The house is heated as the greenhouse warms up from the sun, wastewater fertilizes the crops inside the greenhouse while the water is simultaneously purified and can be reused.

#### Innovative school:

A system for collecting and purifying rainwater, solar panels that provide the school with electricity. Large windows that insulate and act as a greenhouse, heating the building.



### Harads city 2.0

This is our community, Harads City 2.0. Our society is built up of 7 areas: downtown, sports and leisure, service area, industrial area, residential area with schools, rural and agricultural areas, and water and energy. In Harads City, we construct houses using recycled materials, such as plastic, which was once produced in excessive amounts. Nothing in our city is manufactured using fossil fuels. Instead, we build houses from bamboo, natural stone, and invest in new technologies like paper batteries, sustainable energy production from wind, solar, and water, and smart solutions that conserve nature's resources.

### Innovative solutions

#### Cars of the Future

In our society, cars are powered by biogas and air. We produce biogas ourselves in our biogas plant. Biogas is made from food waste and manure, which are leftover from places like the state.

The hover cars are powered by a special engine that sucks in and blows out air underneath the vehicle. Since hover cars don't require paved roads, which are not environmentally friendly, they follow white lines painted with eco-friendly sludge paint.

Location: Luleå, Sweden  
Date: 2023/2024  
Number of Attendees: 16  
Age of Attendees: 15-17

Tools/Media used:  
Minecraft



UrbanTestbeds.JR - Engaging Young Citizens to build a sustainable Urban Future

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Minecraft was used to collaboratively build a future city "Harads City 2.0" in the year 2085.

The city comprised of 7 areas: downtown, sports and leisure, service area, industrial area, residential area with schools, rural and agricultural areas, and water and energy. For each area the responsible group recorded and shared their plan with the other groups.

Houses were constructed using recycled materials, such as plastic, which was once produced in excessive amounts. Nothing in the city was manufactured using fossil fuels; instead, houses are built from bamboo, natural stone and investments. New technologies like paper batteries, sustainable energy production from wind, solar, and water and smart solutions were utilised to conserve natural resources.

Through collaboration and working in teams and across teams a sense of community was established. The class enjoyed learning about what is good for nature, what is sustainable for the environment and about different materials and their environmental impact.





# **Ethics of Engaging Young Citizens**

# AI ethical consideration: Ethical Impacts of AI on User Engagement

## AI and Dehumanization

- Automated Interactions: AI can reduce human-to-human interaction, leading to less personal and empathetic engagement
- Loss of Human Touch: Reliance on AI may lead to users feeling alienated or devalued as decisions and processes become more mechanical and impersonal

## Bias and Discrimination

- Algorithmic Bias: AI systems may unintentionally reinforce societal biases, leading to discriminatory outcomes for certain user groups.
- Ethical Design: To ensure fairness, AI must be designed with diverse datasets and be continuously monitored for bias.

## Transparency and Autonomy

- AI Decisions: Lack of clarity in AI-driven processes can make it difficult for users to understand or question decisions, eroding trust.
- User Autonomy: AI must respect user choices and ensure that engagement is voluntary and informed, without pressure.

## Privacy and Surveillance

- Data Exploitation: AI-related engagement often relies on extensive data collection, raising concerns about privacy and security.
- Data Ethics: Ethical AI systems should prioritize privacy by offering users control over how their data is used and stored.

Ref: Habibipour, A. (2024), "Responsible living labs: what can go wrong?", Journal of Information, Communication and Ethics in Society, Vol. 22 No. 2, pp. 205-218. <https://doi.org/10.1108/JICES-11-2023-0137>

# Ethics of Engaging Children in Future Technologies and AI - Stakeholder Responsibility

*“Artificial Intelligence undoubtedly offers children many opportunities, but it also raises the risk of compromising their rights.*

*While an increasing number of policy initiatives and corresponding research seek to better understand and provide solutions to mitigate the risks and augment the benefits of AI-based technologies for children, there is often a lack of interaction among stakeholders.”*

Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E. (2022)

The following is an introduction to our ethical considerations when working with children and artificial intelligence. These considerations have guided our design process and documentation of the workshops. We believe it is essential to prioritize the well-being of users and participants, especially when engaging with children and AI. The key takeaways from this section is fundamental principles that workshop designs and work rely on.

*Artificial Intelligence and the Rights of the Child Towards an Integrated Agenda for Research and Policy*  
(JRC Science for Policy Report, 2022)



# Ethics of Engaging Children in Future Technologies and AI - artificial intelligence supporting children's rights

The rapid development of AI technologies, driven by the private sector excludes many stakeholders, particularly youth and human rights activists, as well as policymakers. Furthermore, the lack of youth involvement in emerging AI governance processes denies them the right to participate in democratic processes, hindering their ability to co-shape the discourse on the development, assessment, implementation, and regulation of AI technologies. Ethical principles, including transparency, justice and fairness, responsibility, safety and security, and privacy, must be central to all AI developments and deployments. Additionally, it is essential to evaluate the value of AI technologies based on their impacts and benefits for individuals and society. Not all social and economic problems should be addressed through technological solutions, highlighting the importance of assessing AI technologies' consequences comprehensively. (s. 18 un/eu report)

The following is a summary of the five requirements for artificial intelligence supporting children's rights. These requirements are:

I. AI Minimization, Valuable Purpose, and Sustainability What is the purpose of using AI in any given case? Research indicates that society must not consider the usage of AI as unlimited. Given the climate impact of using AI, users need to ask why it is important enough to use AI. This question is generally raised in discussions on the agenda of digitalization: is this use justified? Therefore, children and adults should ask whether the use of AI in their case serves a valuable purpose. Ethical discussions on the value of AI usage are necessary. (EU report pp. 46-47)

*#AI Minimization #PolicyMaking*



Artificial Intelligence and the Rights of the Child - Towards an Integrated Agenda for Research and Policy, Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E., (2022) European Union, 2022

# Ethics of Engaging Children in Future Technologies and AI - artificial intelligence supporting children's rights

II. Transparency, Explainability, and Accountability. Transparency and explainability relate to the right to information, but in practice, they can also create informed and empowered users of AI. Transparency and explainability can promote critical thinking, combat misinformation, and prevent trust issues in AI systems. This can be achieved by creating awareness and knowledge about AI systems, explaining how AI works, and engaging children in discussions about their use and understanding of AI. Accountability is just as important as transparency and explainability. Those responsible for creating and updating AI systems should focus on their AI interactions, especially when children are involved. They should be open about their data, giving children and youth the opportunity to understand how artificial intelligence works. (EU report p. 47)

III. Inclusion and Non-discrimination. The challenges of biased data in artificial intelligence are well-documented. The authors of the report on AI and children's rights have created a figure showing how different levels of inclusion and non-discrimination can be affected. To minimize discrimination, researchers suggest enhancing children's knowledge about AI, thereby fostering understanding and empowerment, or in other words, building capacity. Teachers, parents, and peers can be instrumental in helping children with this capacity building. The next step is to understand how society affects artificial intelligence. Researchers highlight the need to understand the impact of: i) more automation, ii) more data, and iii) machine communication (EU report p. 49). Lastly, there is a focus on policies and lawmakers' opportunities to create laws that safeguard children and enable the regulation and evaluation of AI usage.

*#Transparency, Explainability, and Accountability.*  
*#Inclusion and Non-discrimination.*



Artificial Intelligence and the Rights of the Child - Towards an Integrated Agenda for Research and Policy, Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E., (2022) European Union, 2022

## Ethics of Engaging Children in Future Technologies and AI - artificial intelligence supporting children's rights

IV. Privacy, Data Protection, and Safety. Data and data protection are heavily involved with artificial intelligence, as AI involves processing personal data to create and enable new levels of AI practices. The importance of GDPR laws and regulations becomes apparent here. Users should have the opportunity to use AI while retaining their privacy, which is especially true for children. (EU report p. 50)

V. Integration and Respect of Children's Agency. When designing and working with AI and children, one of the most important considerations is the child's own agency. The use or non-use of AI should always be a choice, and creating a space where the child can choose their own way of engaging with AI is important for their understanding and development in this field. Their agency can be divided into different processes: i) the child's sense of agency, ii) the opportunities provided to a child to exercise agency, and iii) the transformation of opportunities into affordances, by designing systems that help children consciously recognize these opportunities. (EU report p. 50)

*#Privacy, Data Protection, and Safety*  
*#Integration and Respect of*  
*Children's Agency*



Artificial Intelligence and the Rights of the Child - Towards an Integrated Agenda for Research and Policy, Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E., (2022) European Union, 2022



# Ethics of Engaging Children in Future Technologies and AI

The Rights of the Children is a legally-binding international agreement ratified by the European Union. The Rights holds four basic principles described in more detail, in the aforementioned text, to put it simple, The Rights of the Children holds four principles regarding the wellbeing of the child:

- Non-discrimination
- Best interest of the child
- Right to life survival and development
- Respect for the views of the child.

This indicated a foundational framework for our workshop and the implications is the above-mentioned requirements. This constitutes an understanding that relies on the following:

- Protection = do no harm
- Provision = do good
- Participation = include all children.

This is the main idea for UNICEF published a report on Policy Guidance for AI and Children. This Report sets up the following requirements and corresponding recommendations for the development and deployment of child-centred AI.

## Requirements and corresponding recommendations for the development and deployment of child-centred AI.

1. Support children's development and wellbeing;
2. Ensure inclusion of and for children;
3. Prioritise fairness and non-discrimination for children;
4. Protect children's data and privacy;
5. Ensure safety for children;
6. Provide transparency, explainability and accountability for children;
7. Empower governments and businesses with knowledge of AI and children's rights;
8. Prepare children for present and future developments in AI;
9. Create an enabling environment for child-centred AI;

Artificial Intelligence and the Rights of the Child - Towards an Integrated Agenda for Research and Policy, Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E., (2022) European Union, 2022

# Ethics of Engaging Children in Future Technologies and AI - Stakeholder Responsibility

*“It is more important to consider users as a valuable source of knowledge and idea, not to see them as “guinea pigs” for experiment (Eriksson et al., 2005)”.*

*“The participants highlighted the importance of transparency in AI-driven decision-making processes, especially in the context of real-life experimentation. Transparency ensures that the principles of real-life experimentation, accountability and trust remain intact in real living labs, even as AI becomes a fundamental part of the Living Lab project or activity.”*



Habibipour, Abdorasoul, “Responsible living labs: what can go wrong?”, Journal of Information, Communication and Ethics in Society, 2024, V. 22, issue 2.

# Exploration: Why and how to engage young citizens?

## AARHUS Skødstrup Skole - UrbanistAI, Rethinking Children's Spaces (3/4)

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The following will be an dive into our findings and reflections:

The process of prompting children to create something that they, themselves want is more intricate than originally thought. But our findings were that if you created a place where children could think laterally, the process of codesigning in groups became easier. We started to create this Lateral thinking by asking "crazy" questions. This means that the creative process started out with an introduction to AI and AI-photogeneration. This was translated into the visual creative process where the children drew on big laminated pictures so they, themselves could erase it. Thereafter followed a process of prompting UrbanistAI. Here our findings were that simplicity, in the process of prompting created a broader understanding for the goal we were trying to reach. This simplicity created a process where the children could rethink the way, they wanted to think their chosen space.

This co-creative visual process created a democratic aspect in the generation of pictures. The groups were tasked with coming to an agreement. This created group-thinking in ways that the children needed to come to an agreement before they could continue working on their prompt. Therefore it inspired a democratic thinking that everyone had the right to put the mark on the chosen space.



Fig. 1. Sample picture

this is an example of "crazy" questions resulting in "crazy" AI-generated pictures. This is a Cheese-Computer.

Location: Skødstrup, Aarhus, Denmark

Date: 18 April 2024

Number of Attendees: 40

Age of Attendees: 9-12

Tools/Media used: Projector / Screen,  
Laminated Pictures, Markers, UrbanistAI

### Example Explained

This example comes from our workshop at Skødstrup Skole. This is an example of how to engage the children while keeping ethical considerations in mind. We aimed to **"prepare children for present and future developments in AI"** and to **"create an enabling environment for child-centred AI."** This design draws inspiration from the UN's recommendations.

In this case, we wanted to spark an interest in AI while helping the kids understand the tools they were working with. With this purpose in mind, we asked "crazy" questions that would help the children grasp what artificial intelligence is capable of. This approach also laid a foundation for a broader understanding of prompting. We hope this example demonstrates how we integrate ethical considerations into our workshop design.

Artificial Intelligence and the Rights of the Child - Towards an Integrated Agenda for Research and Policy, Charisi, V., Chaudron, S., Di Gioia, R., Vuorikari, R., Escobar-Planas, M., Sanchez, I., Gomez, E., (2022) European Union, 2022



A decorative border made of small white dots. It starts as a horizontal line across the top, then turns 90 degrees downward on the right side, forming an L-shape that frames the central text.

# Use Cases

# Introduction to UrbanTestbeds.JR Use Cases

This section of the playbook will focus on our case studies. Our work can be summarized as an exploration of engagement with, for, and by young citizens. We have concentrated on elements that can drive urban development, foster an understanding of environmental challenges, and support the redevelopment of local areas and communities. We have worked to analyse complex data with children to create opportunities for a broader understanding of local challenges. For us, storytelling - especially through digital means - has proven to be a powerful way forward. While AI can process vast amounts of data, it's storytelling that humanizes the data, making it actionable.

Through our focus on the potential of AI, we learned that workshops could result in data-driven decisions, encouraging local actors and decision-makers to think in new ways, generate new ideas, and visualize potential future outcomes. One key takeaway for us is that the work we have done is context-specific; urban challenges vary significantly across regions. It is important for us to conduct workshops that help uncover these differences while also allowing us to consider how knowledge can be transferred across contexts.

You are now exploring our workshop, and we hope you find inspiration, ideas, knowledge, and understanding that you can take with you.

LULEÅ – Save the World game and chat bot exploration of climate plans3



**Goals**

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

**Methods**

1) Learning about climate change through chatting with an LLM

2) Learning about climate change by helping to improve a game dealing with climate change issues

HAMBURG “Our Digital Neighbourhood” @ Children’s Museum Hamburg6



**Information Check and Annotations**

Location: Hamburg, Germany  
Date: 22 March 2024  
Number of Attendees: 12  
Age of Attendees: 9-12

**Tools/Media used:**  
Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes

AARHUS - Skødstrup Skole - Rethinking Children’s Spaces10

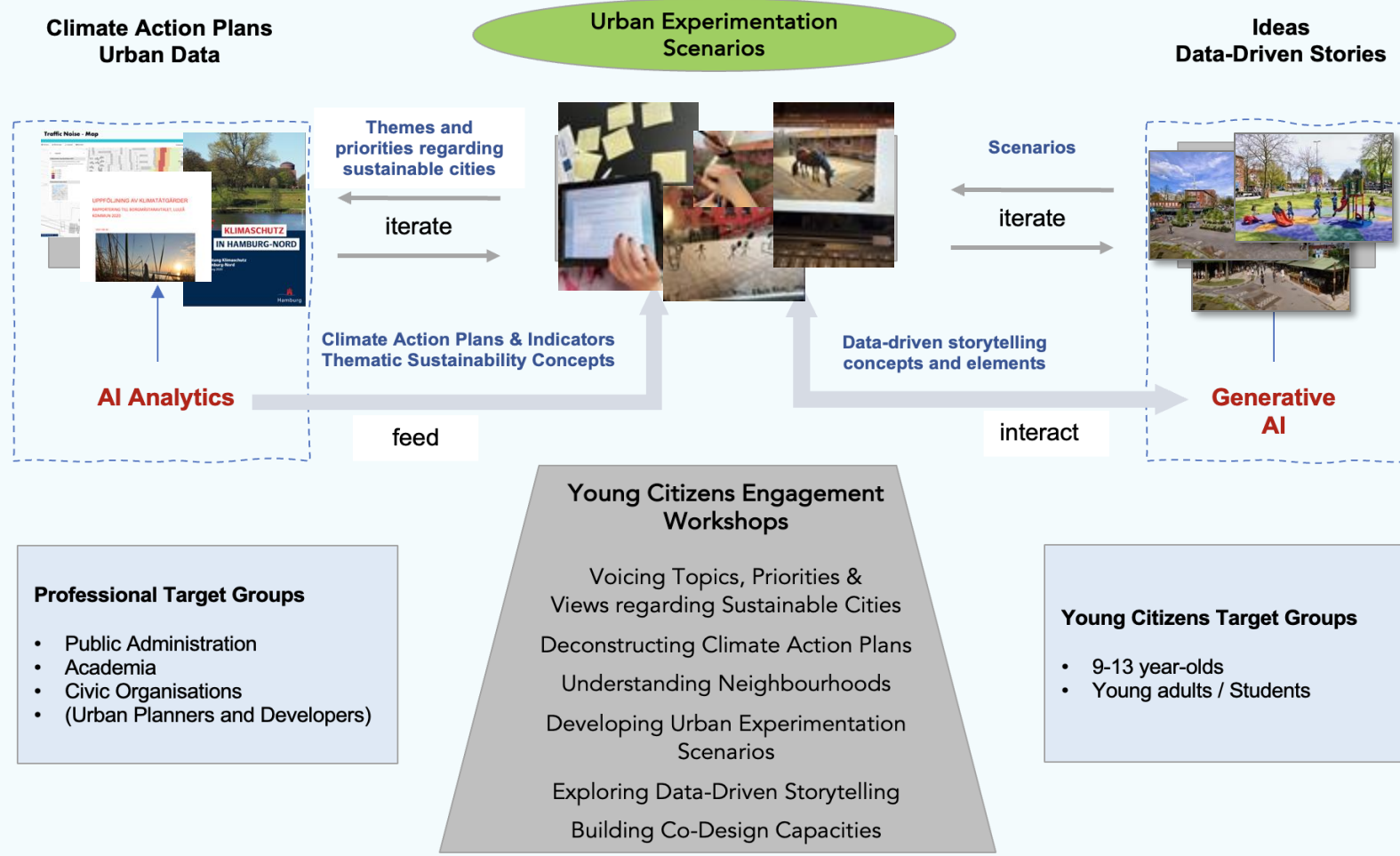


The starting point for this workshop was to explore how children can work creatively and productively with Artificial Intelligence through 'UrbanistAI'.

The process leading up to this consisted of a transregional co-designing process which was done through multiple bootcamps with the different partners and co-pilots in UrbanTestbeds.JR. This included Hamburg, Luleå, Aarhus and DOKK1. This approach was a co-designing-process to the workshop where we, as a transregional team built on our competence for the best approach to the workshop.

The idea of the workshop was to engage young children to think about their surroundings and how to better them to something they wanted. - Our goal for the workshop was to create an understanding of how we as adults can create engagement with children

# The Use Cases in the context of the project architecture



Our conceptual model involves urban data and climate plans to create a springboard for co-creational scenario building.

In our workshops we used local climate plans as an input for chatting with the documents and retrieving insights about climate change regarding the neighbourhood and beyond.

For Hamburg, Aarhus and Luleå several documents were used to create the corpus for the chat (see also use cases chapter for details).

This allowed us to create awareness for climate change related issues among our target audiences.

Based on these insights and the discussion about the environment and its preparedness for the anticipated changes we embarked on generating scenarios for a better urban future.

The scenarios were created using images of the spaces. The participants of the workshops prompted the AI with instructions what they wanted to change and which elements and objects they regarded as helpful to improve the public space.



# List of UrbanTestbed.JR Use Cases

UrbanTestbeds.JR main goals capacity building and exploration of interactive formats to foster awareness and scenario building for climate change induced issues involved numerous interactions with young citizens' involvement.

#	Lead UTJR	Local Partner	Description/Goals	Methods	Age	Date
1	HCU	Children's Museum	Young Architecture Summer	Issue identification/discussion	5-12	06/23
2	LTU	Teknikens Hus	Harads City 2.0/Simulation	Hackathon with Minecraft	9-11	23-24
3	LTU	Teknikens Hus	Children's Workshop	Game testing and chatbot interaction	11-12	09/23
4	LTU/HCU	Coding Pirates & DOKK1	Literacies of the futures	Game testing and chatbot interaction	10-12	11/23
5	AU	DOKK1 Central Library	Audiotales Workshop	Audiotales / Recording	24-68	7-11/23
6	HCU	Children's Museum	Holiday program for school kids	Urban Data Portal Hamburg	9-12	03/24
7	HCU	Code for Hamburg	Young Forum Open City	Scenario building + Urban Ideation	10-11	04/24
8	VUoAS	--	Communicate skills on sustainability	Circulation shelve	19-20	12/23
9	AU	DOKK1 Central Library	Stories for the planet	Audiotales / Recording	18-28	09-12/23
10	AU	DOKK1 Central Library	Rethinking Children's Spaces	Urban Ideation with UrbanistAI	9-12	04/24
11	HCU	Hamburg Central Library	Explore school neighbourhood, reimagine space	Urban Data Portal + Urban Ideation	22	07/24
12	AU	DOKK1 Central Library	Rethinking Urban Spaces	Workshops with UrbanistAI	25-65	08/24
13	HCU	ARIC + Central Library	Explore AI for urban development	Urban Ideation with UrbanistAI	16-17	09/24
14	LTU	Luleå Municipality	Improve school children's route to school	VR exploration and ideation with UrbanistAI	12-13	10/24

## Workshop Goals

Understand awareness level of children for urban development issues and climate change impact.

## Workshop Description

In this workshop we encouraged the children to ponder about issues and mitigation of climate change and urban living challenges. The children were asked about their thoughts about climate change and its impact on their life. Selected “prompts” were written on the paper covered tables to induce thinking about specific topics like waste, recycling, water, drought, plants.

The process was planned to contain three parts:

- What is important to you when it comes to climate protection in your neighborhood?
- What is your vision/what should change in the future?
- How to achieve this?

We had to deviate from the original schedule because the children did not arrive at the same time, and we therefore worked in shorter rounds. The concentration also decreased after one round (about 15 minutes), so we let the children move on. The play/Lego corner next door was helpful because the children could physically exert themselves there as a balance to the sitting and thinking work with us

We had also planned to record all the results in writing, but since some children weren't quite sure about writing, we simply had many things drawn. Some children had discussed topics such as recycling at school and had some prior knowledge

**Location:** Hamburg, Germany

**Date:** 18 June 2023

**Number of Attendees:** 7

**Age of Attendees:** 5-10

**Tools/Media used:** Paper, Pen



## Workshop Outcomes

The children expanded the given „prompts“ by adding words or drawings to express their ideas related to the topic. This was facilitated by the discussion amongst the children and the facilitators.

Topics identified and discussed were:

- Recycling (waste) and garbage trucks, more trash cans in city
- Traffic, easier crossing of large streets with median strips, longer green phases for pedestrians, more e-mobility, fewer emissions
- Plants in the city, more greenery. Animals in the city, creating more habitat for animals.

Overall, it can be said that many children have a concept of environmental protection, but it is still very abstract. In thinking about their own living space and through guided storytelling ("What happens on your way to school"), the children discovered more and more topics. However, this is very much influenced by the nudges of the facilitators. To expand the space for thinking about climate and sustainability related issues it could be beneficial to prepare some more scenarios to encourage the children to think in different directions.

**Location:** Hamburg, Germany

**Date:** 18 June 2023

**Number of Attendees:** 7

**Age of Attendees:** 5-10

**Tools/Media used:** Paper, Pen





In our class, we are 16 students. We divided ourselves into 7 groups with different areas of focus, but we chose to build closer together in the competitive world so that everything is more consolidated and it's easier to help each other.

When you visit our community, it is the year 2085.



## Harads city 2.0

This is our community, Harads City 2.0. Our society is built up of 7 areas: downtown, sports and leisure, service area, industrial area, residential area with schools, rural and agricultural areas, and water and energy.

In Harads City, we construct houses using recycled materials, such as plastic, which was once produced in excessive amounts. Nothing in our city is manufactured using fossil fuels; instead, we build houses from bamboo, natural stone, and invest in new technologies like paper batteries, sustainable energy production from wind, solar, and water, and smart solutions that conserve nature's resources.

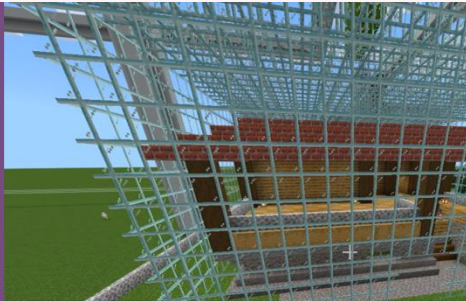
## Innovative solutions

### House in a greenhouse:

The house is heated as the greenhouse warms up from the sun; wastewater fertilizes the crops inside the greenhouse while the water is simultaneously purified and can be reused.

### Innovative school:

A system for collecting and purifying rainwater, solar panels that provide the school with electricity. Large windows that insulate and act as a greenhouse, heating the building.



## Innovative solutions

### Cars of the Future

In our society, cars are powered by biogas and air. We produce biogas ourselves in our biogas plant. Biogas is made from food waste and manure, which are leftover from places like the stable.

The hover cars are powered by a special engine that sucks in and blows out air underneath the vehicle. Since hover cars don't require paved roads, which are not environmentally friendly, they follow white lines painted with eco-friendly sludge paint.



Location: Luleå, Sweden

Date: 2023/2024

Number of Attendees: 16 / over 300 in total

Age of Attendees: 15-17

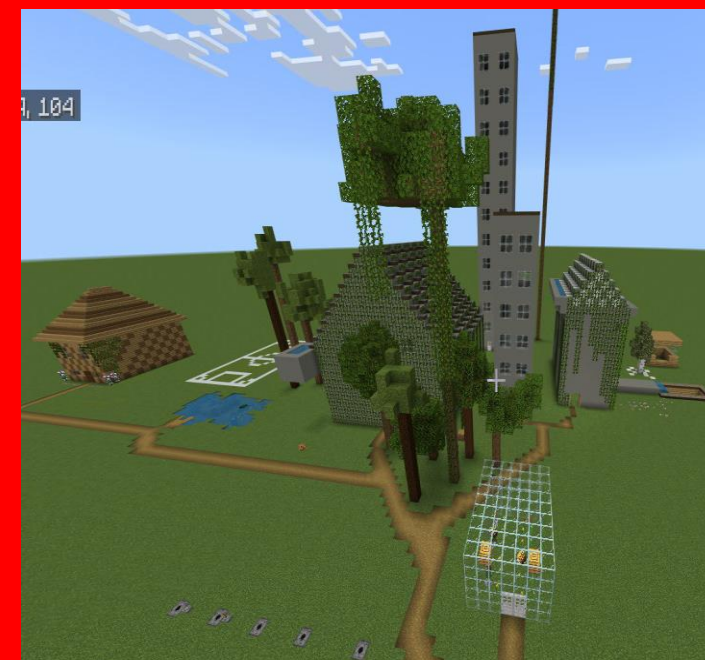
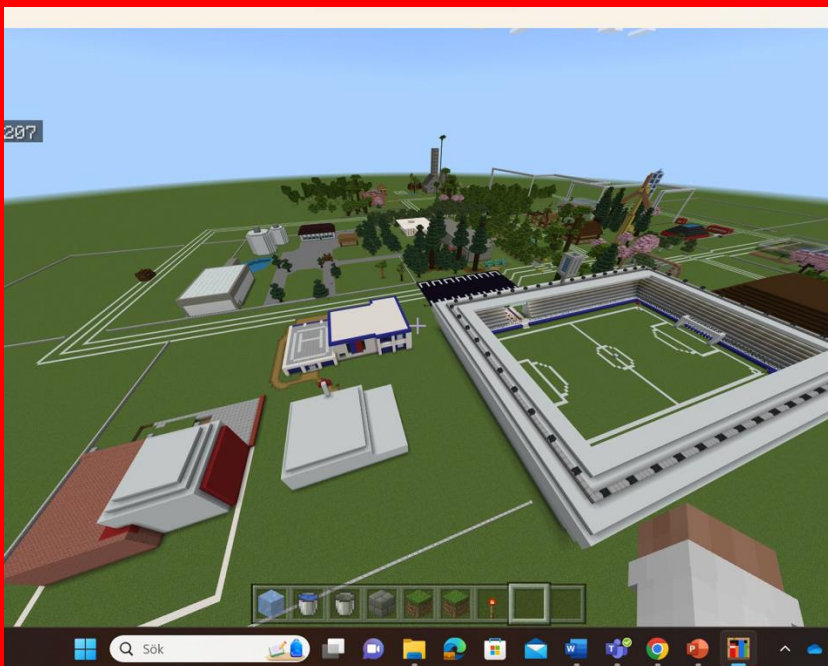
Tools/Media used:

Minecraft

## SKOLHACKATHON I MINECRAFT









## Workshop Goals

Involve young students in designing their future city

## Workshop Description

This workshop was organised around using Minecraft to design your future community of 2085

The children were presented a scenario about the future community of 2085, they worked in groups to design the future community using Minecraft.

- Harad school students were divided into 7 groups.
- The prompt for the 2085 scenario was to plan a sustainable Harads 2.0 and eliminate digital divide between Harads as a rural area and urban communities..
- Each group had its own focus (downtown, sports and leisure, service area, industrial area, residential area with schools, rural and agricultural areas, and water and energy).
- They built in the same Minecraft world.

Workshop outcomes: young citizens learned about

- What's good for nature
- What's sustainable for the environment
- Different materials and their environmental impacts
- The Minecraft hackathon was a good alternative for traditional teaching methods.

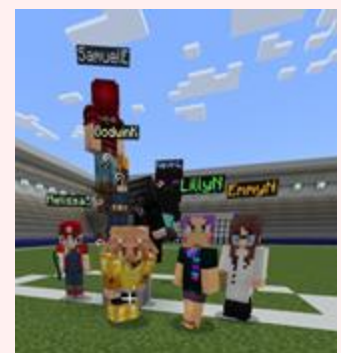
**Location:** Luleå, Sweden

**Date:** 2023/24 (several weeks)

**Number of Attendees:** 16 / over 300 in total

**Age of Attendees:** 9-11

**Tools/Media used:** Minecraft







## Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Methods

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues

## Workshop Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Workshop Description

This workshop was organised around two topics:

### 1) Learning about climate change through chatting with an LLM

The children were introduced to the home-grown chatbot which was preloaded with documents regarding climate change mitigation strategies and plans from Luleå/Sweden. They could raise their questions and get into a dialogue with the chatbot

### 2) Learning about climate change by helping to improve a game dealing with climate change issues

The children were asked to play a game on a tablet and provide feedback regarding errors and potential areas for improvement for the game. Since the game was still under construction there were some obvious errors but also the usability and fun to play were considered as areas to be considered for improvement.

**Location:** Luleå, Sweden

**Date:** 29 September 2023

**Number of Attendees:** 28

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Home-grown, Tablet Game





## Workshop format:

- 10:00-10:30: Group 1
  - Brief introduction about children's engagement and the two projects, SynAir-G and UrbanTestbeds.JR
  - Introduction to the game "Save the World" and the chatbot
  - Explaining the questionnaire and a reminder to take notes during the game
- 10:30-11:00: Group 2 (Repeat of the same process as group 1)
- 11:00-12:00: Lunch
- 12:00-12:15: Chatbot demonstration for kids
- 12:15-13:00: Participants will play the game in 14 groups of two
- 13:00-13:30: Completion of the questionnaire in groups of four. We will display each question, allow them to think and answer, and then rotate to the next question.
- 13:30: Fika: They will enjoy some ice cream!

**Location:** Luleå, Sweden

**Date:** 29 September 2023

**Number of Attendees:** 28

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Home-grown, Tablet Game





## Workshop Outcomes

Chat dialogue, key questions from children, adoption of chat interface

The kids were given brief explanation of climate change. Initially, 1 kid tried the chatbot. Other kids followed.

On their own, with the help of the chatbot, they quickly narrowed down to one cause of climate change which is plastic consumption. They could be seen helping each other come up with questions and discussing what they learned.

The kids learned about air pollution from trivia provided in the game.

Our take aways from this workshop were:

- Suggestions for improvement of the game
- Identified climate change topics that young citizens are curious about
- Identified climate change data and plans needed to feed the chatbot
- Identified improvements to chatbot

**Location:** Luleå, Sweden

**Date:** 29 September 2023

**Number of Attendees:** 28

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Home-grown, Tablet Game





## Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Methods

- 1) Learning about climate change through chatting with an LLM
- 2) Learning about climate change by helping to improve a game dealing with climate change issues

## Workshop Goals

Get to know key concerns and questions children would raise regarding climate change, foster understanding of climate change related issues by involving children in the development of a game, understand effectiveness of engagement methods and acceptance and suitability for the selected age group.

## Workshop Description

This workshop was organised around two topics:

### 1) Learning about climate change through chatting with an LLM

The children were introduced to the chatbot which was preloaded with documents regarding climate change mitigation strategies and plans from Aarhus/Denmark. They could raise their questions and get into a dialogue with the chatbot

### 2) Learning about climate change by helping to improve a game dealing with climate change issues

The children were asked to play a game on a tablet and provide feedback regarding errors and potential areas for improvement for the game. Since the game was still under construction there were some obvious errors but also the usability and fun to play were considered as areas to be considered for improvement.

**Location:** Aarhus, Denmark

**Date:** 8 November 2023

**Number of Attendees:** 19

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Easy-Peasy-AI, Tablet Game





## Workshop Description

- Demonstrated the game "Save the World" to teachers, librarians, and kid museum curators
- Young citizens session
  - Introduction:
    - i. Brief introduction about children's engagement and the two projects, SynAir-G and UrbanTestbeds.JR
    - ii. Introduction to the game "Save the World" and the chatbot
    - iii. Explaining the questionnaire and a reminder to take notes during the game
  - Participants played with the game.
  - Completion of the questionnaire in groups of two. We will display each question, allow them to think and answer, and then rotate to the next question.
  - Chatbot demonstration

## Workshop Outcomes

Chat dialogue, key questions from children, adoption of chat interface

- Suggestions for improvement of the game
- Identified climate change topics that young citizens are curious about
- Identified climate change data and plans needed to feed the chatbot

**Location:** Aarhus, Denmark

**Date:** 8 November 2023

**Number of Attendees:** 19

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Easy-Peasy-AI, Tablet Game



## Workshop Outcomes

Chat dialogue, key questions from children, adoption of chat interface

The kids liked that they were part of the game development instead of being user testers.

The kids gave recommendations included refining user account management, clarifying questionnaire requirements, enhancing game adjustability and help features, fixing bugs related to saved progress and sound control, and ensuring smoother gameplay experiences.

Our take aways from the workshop:

- Suggestions for improvement of the game
- Identified climate change topics that young citizens are curious about
- Identified climate change data and plans needed to feed the chatbot

**Location:** Aarhus, Denmark

**Date:** 8 November 2023

**Number of Attendees:** 19

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Easy-Peasy-AI, Tablet Game



## Save the World Game – Results

The feedback from the tests highlighted several areas for improvement, acknowledging potential misunderstandings due to limited usage:

- Inability for multiple kids to use the same device seamlessly.
- Lack of clarity on mandatory questionnaire questions.
- Non-adjustable games when switching phone orientation.
- Malfunctioning help buttons.
- Missing or hard-to-find game instructions.
- Issues with saved answers and progress reset functions.
- Unclear profile visibility and login status.
- Persistent sound despite app switching.
- Various game glitches and freezes.

Recommendations included refining user account management, clarifying questionnaire requirements, enhancing game adjustability and help features, fixing bugs related to saved progress and sound control, and ensuring smoother gameplay experiences

**Location:** Aarhus, Denmark

**Date:** 8 November 2023

**Number of Attendees:** 19

**Age of Attendees:** 11-12

**Tools/Media used:** Tablets, Projector / Screen, Post-it, Chatbot Easy-Peasy-AI, Tablet Game







Capacity building took place through bootcamps with stakeholder groups, but also by mirroring co-creation activities for young citizens.

During the Future Literacies-conference in Aarhus (Nov. 2023), UTJR-team members replicated the children's and students' experience of creating audio stories with foley sounds, adapting planetary short fiction written by first year literature-students as part of the Stories for the Planet-course.

The Audio Stories created by students are accessible with Aarhus Libraries, and stored at DIGTCOM Aarhus University

IRISLab, DOKK1 offers media literacy and production environments for storytelling in primary school. From Fall 2023 IRISLab joined UTJR as an associate partner and enabler of both university students, researchers and urban developers

The Next Generation Conference: Literacies of the Futures was a two-day conference with expert talks, project presentations, and not least hands-on workshops engaging children, youth, and adults in intergenerational co-creation across creativity and future technologies. Playfulness and imagination were at the core of exploring future literacies, also acknowledging a (post-covid) loss of imagination and play in much formal education and lack of experimental and human-centered approaches to future technologies and wicked problems.

## Our Workshop Goals was to answer:

- What part does technological playfulness play in the futures' literacies?
- How can kids and youth grasp the future?
- How can adults support kids and youths' playful approach to the world and to technologies?

Adults should do the same as the children.

**Location:** Aarhus, Denmark

**Date:** 07 November 2023

**Number of Attendees:** 30

**Age of Attendees:** 24-68

**Tools/Media used:** Projector / Screen, midi-controller, headset, computer, recording equipment.



Our findings from The Next Generation Conference: Literacies of the Futures shed light on the significance of technological playfulness in shaping future literacies. Through expert talks, project presentations, and hands-on workshops, we discovered that playfulness and imagination are essential elements for exploring and understanding future technologies.

One notable observation was the acknowledgment of a perceived decline in imagination and play, particularly in formal education settings, possibly exacerbated by the post-COVID landscape. This deficit highlights the importance of fostering experimental and human-centered approaches to future technologies and addressing complex challenges.

In addressing our workshop goals, we found that technological playfulness serves as a vital tool for enhancing future literacies among children and youth. It provides them with opportunities to engage creatively with emerging technologies and envision possibilities for the future. Additionally, our research underscored the crucial role of adults in supporting and nurturing the playful approach of children and youth towards both the world and technologies. By encouraging curiosity, experimentation, and a human-centered mindset, adults can empower the next generation to navigate and shape the future with confidence.

**Location:** Aarhus, Denmark

**Date:** 07 November 2023

**Number of Attendees:** 30

**Age of Attendees:** 24-68

**Tools/Media used:** Projector / Screen, midi-controller, headset, computer, recording equipment.





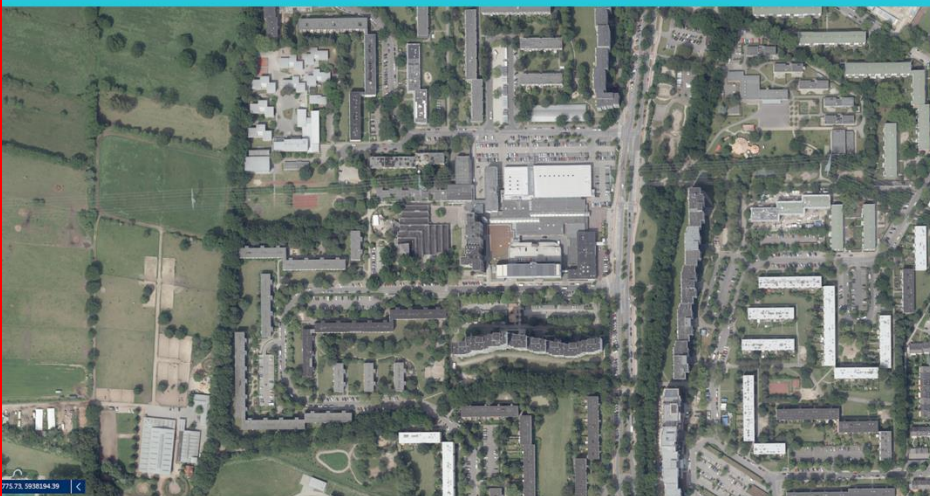
# HAMBURG “Our Digital Neighbourhood” @ Children’s Museum Hamburg

6

Klick and Neighbourhood – three dimensional



Klick and Neighbourhood – Aerial Photo



Klick and Neighbourhood – Map



Klick and Neighbourhood – Street Trees



Traffic Noise - Map



Location: Hamburg, Germany

Date: 22 March 2024

Number of Attendees: 12

Age of Attendees: 9-12

Tools/Media used:

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes





## 4

# Informationen Check and Annotations

Themen

Werkzeuge

Legende

Kontakt

Flurstückensuche

Einschleieranzahl abfragen

Informationen abfragen

Karte Drucken

Koordinaten / Höhe

Strecke / Fläche messen

**Zeichnen / Schreiben**

Daten import

WMS hinzufügen

Auswahl speichern

Routing

Suche Adresse, Stadtteil, Themen, Flurstück

X

Q

Zeichnen / Schreiben

Zeichnung ein-/ausblenden

Geometrie

Symbol

Form

Füllfarbe

Geometrie / Text zeichnen

Rückgängig machen

Wiederholen

Geometrie bearbeiten

Attribute bearbeiten

Geometrie / Text löschen

Alles löschen

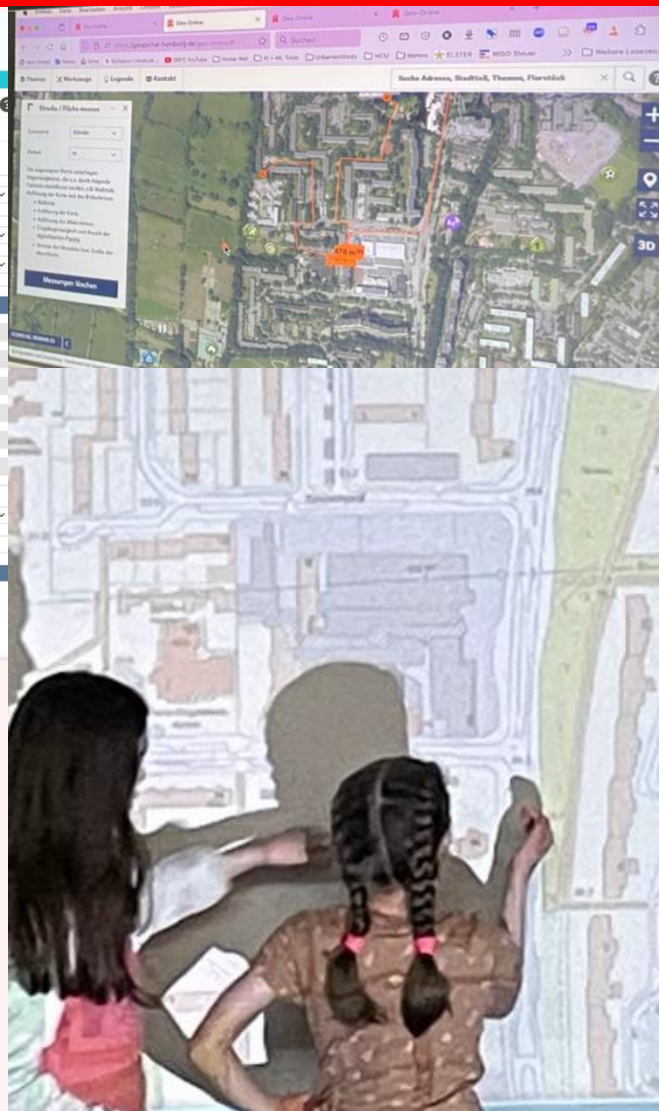
Hinterladen

Format

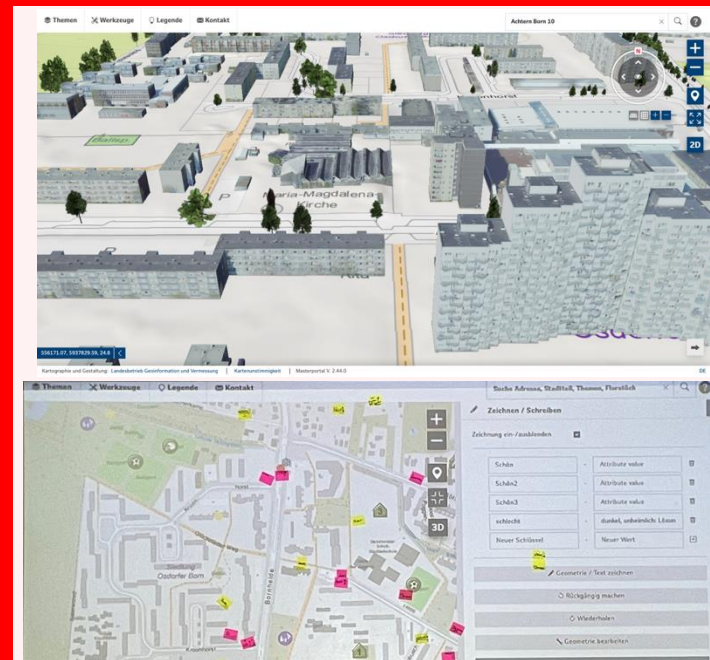
Datenname

Zeichnung speichern

Which places would you like to change? How?



## Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes



## Workshop Goals

Understand children’s concerns regarding their neighbourhood including climate related issues but also liveability and wellbeing. Furthermore, test applicability of spatial planning tools like GIS and specific data layers for the interaction with school children. This includes the capability to understand effectiveness, acceptance and suitability of selected engagement methods for the selected age group.

## Workshop Description

We took two steps to engage with the group.

- First, we used the 3D-Model of Hamburg and walked the children through a view of their neighbourhood.
- Second, we used a 2D representation of the same neighbourhood to explore the routes they take from their homes to school and to other places they frequently visit (e.g. playground, childrens’ museum, school, home).

Furthermore, they annotated places they like and they do not like and gave some explanation about the reasons. They put Post-It’s at the projection of the map and in a second step we recorded the information in the annotation tool of the geo-portal application. This served the purpose of making the children understand how information can be transferred from the real world into a digital representation.

**Location:** Hamburg, Germany

**Date:** 22 March 2024

**Number of Attendees:** 12

**Age of Attendees:** 9-12

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector /  
Screen + Sticky-Notes





## Workshop Outcomes

Initially the children needed a while to locate familiar places and buildings on the map. This was particularly obvious with the 3D map. After a period of observation and explanation by the facilitators they went to the projected map and pointed out places they identified.

Afterwards we asked them to spot their homes. This worked well and they were able to find their homes and while spotting the location they mostly mentioned their home as a location they like. This brought us to the next step of the workshop. We asked them to identify places they like, and they do not like and put a sticky-note to these locations. After they had become familiar with reading the map they easily found these places and sometimes followed familiar routes on the map (e.g. home to school) to find specific locations where they felt uncomfortable as well as where they enjoy being.

Examples for locations:

- Positive: playground, home, children’s museum, school
- Negative: place where an accident happened, wide street with a lot of traffic and noise, school

**Location:** Hamburg, Germany

**Date:** 22 March 2024

**Number of Attendees:** 12

**Age of Attendees:** 9-12

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes



## Workshop Outcomes

Further we asked them what could be done to improve the situation.

The proposed solutions ranged from improved lighting at night (security and safety) to a narrowed street with several bends and green to reduce traffic speed and noise.

**Location:** Hamburg, Germany

**Date:** 22 March 2024

**Number of Attendees:** 12

**Age of Attendees:** 9-12

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector /  
Screen + Sticky-Notes



## Workshop Goals

Create awareness for public space and need to change (e.g. a lot of traffic, noise, little space for people) and think about measures to create a more liveable and human friendly environment.

## Workshop Method

We first explained the scope of the workshop and the steps to follow. After we discussed a little about what makes a city liveable and what may be missing, we introduced the spaces we wanted to work with. One of the two spaces was selected by the whole group. Afterwards the tool UrbanistAI was explained. Then we started the activity following these steps:

- Split audience into two groups
- Participants individually select two printed images they like
- Explain to the group why you made the selection
- Decide in the group which two images you like best
- Take the tablet and enter the application urbanistAI
- Enter the creation process by selecting one of three photographs of the space
- Select prepared visual prompts (start with the two printed images your group selected)
- Create AI image
- Discuss what you like and what not
- Try again with a changed prompt

We applied three methods of prompting: visual selection of predefined prompts, creating own text prompt, drawing in real world photographs and add desired elements. The drawing was partly handled as a co-creative exercise which created a lot enthusiasm and joy among the children.

**Location:** Hamburg, Germany

**Date:** 25 April 2024

**Number of Attendees:** 5 + 6

**Age of Attendees:** 11/12

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI





## Workshop Planning and Materials

Starting with an ideation canvas we created a workshop outline, setting the goals, the theme as well as challenges and opportunities to involve the targeted stakeholders and participants.

The workshop was structured in four main parts:

1. Understanding the need for change in the urban environment
2. Getting familiar with the spaces under consideration
3. Co-Creating scenarios leveraging the tool urbanistAI
4. Discussing changes and anticipating impact on liveability

### A - WORKSHOP IDEATION -

<b>GENERAL INTRODUCTION</b> Write a text that summarises all the other points of this workshop template.  Placemaking 2025: we would like the kids to design spaces with high quality to spend time for meeting friends, relaxing, ...  We use photos from three different public spaces  Verbal Prompting, Additive Prompting, What do you like, What do you dislike? Use of Visual Library?  Discuss the various visualisations - Voting - Places Discussion	<b>THEME</b> What is the general theme of the workshop? What topic stakeholders should explore?  Urban Greening in city neighbourhoods  Public spaces re-designed as meeting points with little traffic (Rothenburgort, Streimbek, Wandbek)	<b>TIME HORIZON</b> What is the time-horizon of your scenario? What is the year you expect stakeholder to think about for their scenarios?  2025++	<b>IMPACTS / OUTCOMES</b> How will you use the outcome of this workshop to generate impact? How are you going to share the results? Is the main outcome running the workshop itself?  <b>Goal: engagements: how can kids participate in urban co-design?</b>  <b>Outcome: knowledge about engagement</b>
<b>LOCATION/S</b> What are the locations where you intend to run the workshop?  HafenCity University Hamburg, demo center for digital urban planning solutions	<b>STAKEHOLDERS</b> Who are the group of stakeholders invited?  Young Citizens, aged 12-14 (Girls & Boys Day) Academic Institution Cultural Institution	<b>CHALLENGES AND OPPORTUNITIES</b> What are the challenges of your scenarios? What are the opportunities to reimagine a new future?  <b>Challenges:</b> <ul style="list-style-type: none"> <li>- We have 45-60 minutes with two groups</li> <li>- Relevance of places for the participants</li> <li>- Time Horizon</li> </ul> <b>Opportunities:</b> <ul style="list-style-type: none"> <li>- Ability to co-design</li> <li>- Enjoying the low-barrier engagement</li> <li>- Immediate results and responses</li> </ul>	<b>KPIs</b> What are the measurable and quantifiable Key Performance Indicators of this workshop?  <b>Running the workshop as competency building</b>  <b>Multiple visualisations from kids</b>  <b>Voting and discussion protocol</b>

**STÄDTE PLANEN MIT AI**  
Urban Testbeds Junior Workshop zum Girl's & Boy's Day

**Lasst euch inspirieren**  
IDEENFINDUNG MIT HILFE VORBEREITETER PROMPTS/SZENARIEN

**Städte für Kinder und Jugendliche?**  
Was braucht eine Stadt, damit ihr euch gern darin aufhaltet?

**Welchen Ort wollen wir verändern?**  
AUSWAHL DER PLÄTZE

**Visualisierung mit AI**  
AUS BASIS Eurer IDEEN

**Location:** Hamburg, Germany

**Date:** 25 April 2024

**Number of Attendees:** 5 + 6

**Age of Attendees:** 11/12

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI



## Workshop Outcomes

The attending children were capable of understanding and discussing the need for change to create a more liveable and human friendly environment. They discussed their desires in terms of elements they would like to see and the impact this would have on the environment and how it would be perceived by them. Co-creating on the projected screen by prompting the AI with drawings was very well received and spawned instant debate about the things the group liked and disliked. By adding specific elements and trying different ways of drawing these they came very close to what they envisioned for the space.

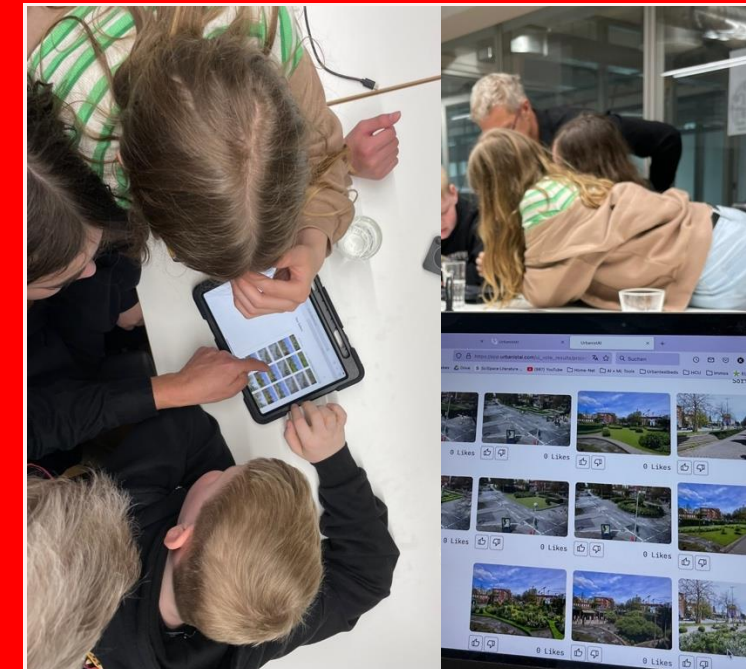
**Location:** Hamburg, Germany

**Date:** 25 April 2024

**Number of Attendees:** 5 + 6

**Age of Attendees:** 11/12

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI





## Stakeholder Workshop

Professionals from citizen organisations, libraries, academia and businesses discussed how to engage young citizens in urban co-creation and development leveraging experiences from UrbanTestbeds.JR use cases and contributions from UrbanistAI and Code for Hamburg.

The discussion emphasized the complexity of effectively engaging youth and children, highlighting the need for a multifaceted, flexible, community-driven approach that empowers participants and ensures their voices are heard and acted upon.

1. Reaching the target audience is challenging: Traditional methods of inviting youth and children to participate in initiatives are not effective. Organizations need to go to where the children and youth are and connect with people who know their communities best.
2. Sustaining engagement is key: Even if initial engagement is successful, keeping youth interested and invested is a challenge. Allowing participants to have ownership and flexibility in the project is crucial for maintaining engagement.
3. Encourage thinking beyond individual needs: Participants should be encouraged to consider the broader impact on their community and environment. Discussions around long-term sustainability and expansion are important. Taking ownership and responsibility beyond personal needs should be endorsed.
4. Balance formal and informal engagement models: There is often a middle ground between formal, regulated participation and grassroots-driven engagement. Districts or municipalities can encourage participation while allowing flexibility for the participants to influence/co-manage the process.
5. Empower underrepresented voices: Engaging marginalized groups, such as minorities or low-income youth, and giving them a platform to shape their experiences is vital.
6. Provide feedback and demonstrate impact: Recognizing participants' contributions and showing how their input influenced outcomes is essential for maintaining trust and motivation.
7. Navigate data and legal barriers: Accessing relevant data and information can be challenging. Legal constraints can hinder innovative, participatory approaches like using sortition to engage citizens.

**Location:** Hamburg, Germany

**Date:** 25 April 2024

**Number of Attendees:** 25

**Age of Attendees:** Adult / Professionals

**Tools/Media used:** Projector / Screen, UrbanistAI





## Activity Goals

To promote young citizens knowledge and skills on sustainability issues in the urban environment. Help them identify and find solutions that they can implement. To create one tangible solution that meets the goals of sustainability and can promote the activity of young people as a group of society in the direction of sustainability. Communicate with the storytelling about the need for everyone to change some of their habits, thereby jointly promoting the achievement of sustainability goals in the city and beyond.

## Activity Description

The project activity was included in the content of the course "New media and politics", which aims to promote civic activism with hands-on projects.

To arrive at the result, the students completed several stages:

- Acquaintance with Valmiera's Sustainability Development Strategy
- Street interviews to find out the problems faced by peers in the city
- Identification and evaluation of possible solutions
- Choice of solution and practical implementation
- Communication activities

By implementing such a project, the competence was developed to allow young people to get involved in the development of the city's sustainability, to give them the opportunity to identify current problems themselves, as well as to find a solution to them. The viability of the implemented project proves that this is a successful way to reach out and involve young people in creating a friendly urban environment for them.

**Lead:** Vidzeme University of Applied Science

**Location:** Valmiera, Latvia

**Date:** 01.09. – 27.12., 2024

**Number of Attendees:** 7

**Age of Attendees:** 19-20

**Tools/Media used:** Projector/Screen, shared web documents, on-line meetings, online survey, Canvas for visual materials etc.



## Activity Goals

To promote young citizens knowledge and skills on sustainability issues in the urban environment. Help them identify and find solutions that they can implement. To create one tangible solution that meets the goals of sustainability and can promote the activity of young people as a group of society in the direction of sustainability. Communicate with the storytelling about the need for everyone to change some of their habits, thereby jointly promoting the achievement of sustainability goals in the city and beyond.

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**Location:** Valmiera, Latvia

**Date:** 01.09. – 27.12., 2023

**Number of Attendees:** 7

**Age of Attendees:** 19-20

**Tools/Media used:** Projector/Screen, shared web documents, on-line meetings, online survey, canvas for visual materials etc.



## Activity Outcomes

- The students chose to realize the idea of creating a circulation shelf - where everyone can put things they don't need, but still useful.
- A survey of university students was conducted, to decide, where to place such a shelf.
- Chosen place: dormitories.
- Visual materials were prepared about the rules - what things can be placed in the closet and what can't; what is its purpose.
- The project used a previously used shelf, students did renovation by themselves, thus promoting a sustainable approach from the very beginning of the project.
- After the course, the student group received invitations to create a similar project in other places around city.
- This is so far the most sustainable solution developed within the course - as it continues to be actively used even after the end of the course.

By implementing such a project, the competence was developed to allow young people to get involved in the development of the city's sustainability, to give them the opportunity to identify current problems themselves, as well as to find a solution to them. The viability of the implemented project proves that this is a successful way to reach out and involve young people in creating a friendly urban environment for them.

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**Tools/Media used:** Projector/screen, shared web documents, on-line meetings, online survey, canvas for visual materials etc.

Video: [creating a circulation shelf](#)





The Following overview over the workshop Stories for the Planet. The goal of the workshop was to explore storytelling and the impact and perspective of experimentation with anthropocene objects in storytelling. This was done to give a voice to those voiceless objects, to create an understanding for shared agency.

Our design process was anchored in our previous workshops, such as our workshop focused on the Audiotales project. This workshop was held for our stakeholders on September 11, 2023, and aimed to solve the same task as the first-year students. The task was to:

1. Create a story involving an object without agency.
2. Transform this story into an audio product.
3. Develop an exhibition based on this product.

This workshop spanned several months and was part of the students' exam project. What we observed was that, in their design process, they considered what their object would think, but from a human perspective—for example, how would a human think the moon would think. This was both a strength and a weakness, but it provided insights into how we as humans approach anthropocene problems.



Fig. 1: Sample picture

Fig. 1 is a sample picture from the presentation at the end of the workshop, this picture showcases the exhibition piece

**Location:** DOKK1, Aarhus, Denmark

**Date:** 1/9-2023 → 4/12-2023

**Number of Attendees:** 40+

**Age of Attendees:** 18-28

**Tools/media:** Zoom Recorder, Audacity, Headset, Computer.

40+ first year students (comparative literature) wrote eight climate stories (8 groups of 5+ students) – the frame of which was to write from a non-human perspective (e.g. an albatross, a plastic bottle, the loneliness of the butterfly bush, the ocean and the moon in conversation) and to re-mediate the written stories into audio (recorded sound, foley sound, sound edition). The written stories were to be no longer than 2000 characters.

The non-human perspective was inspired by the literature, criticism and theory read and was also a case of speculative narration.

The written stories were shared with school children through IRISlab (media-production lab, DOKK1, Aarhus) and the first-year students visited IRISlab and also had a concluding workshop on their audio-productions at IRISlab.

The audio-productions were made with simple audio-recorders (Zoom) and open access audio-editing software (Audacity). Although some students (with skills from music editing) would use more professional software, all students experienced that audio-narratives and the process of creating such media-stories open to other creative sensibilities and affects when approaching and communicating climate- and biodiversity crisis.



Fig. 1: Sample picture

Fig. 1 is a sample picture from the presentation at the end of the workshop

**Location:** DOKK1, Aarhus, Denmark

**Date:** 1/9-2023 → 4/12-2023

**Number of Attendees:** 40+

**Age of Attendees:** 18-28

**Tools/media:** Zoom Recorder, Audacity, Headset, Computer.

The audio-stories were 'exhibited' at DOKK1 in an installation with QR-codes for each story, the written story and recommended literature for further reading. The Installation / exhibition furniture was designed by BA-student Jens Vaarmark, who also provided technical advice on sound editing and last, but not least created a whispering sound-piece for the exhibition installation to attract the library audience.

Stories for the Planet was also shared on the Aarhus Libraries-website, where they can still be found and listened to

(<https://www.aakb.dk/nyheder/litteratur/lyt-til-otte-fortaellinger-fra-planeten#:~:text=Studerende%20fra%20Litteraturhistorie%20p%C3%A5%20Aarhus,er%20otte%20korte%20lydfort%C3%A6llinger%20lyd>).

Stories for the Planet are stored on DIGTCOM Sound Cloud (Center for Digital and Green Transformation of Cities and Communities), Aarhus University

(<https://soundcloud.com/adrienne-heijnen/sets/fortaellinger-til-planeten>)



Fig. 1 is a sample picture from the presentation at the end of the workshop, this picture showcases the exhibition piece

**Location:** DOKK1, Aarhus, Denmark

**Date:** 1/9-2023 → 4/12-2023

**Number of Attendees:** 40+

**Age of Attendees:** 18-28

**Tools/media:** Zoom Recorder, Audacity, Headset, Computer.





The starting point for this workshop was to explore how children can work creatively and productively with Artificial Intelligence through 'UrbanistAI'.

The process leading up to this consisted of a transregional co-designing process which was done through multiple bootcamps with the different partners and co-pilots in Urbantestbed Jr. This included Hamburg, Lulåe, Aarhus and DOKK1. This approach was a co-designing-process to the workshop where we, as a transregional team built on our competence for the best approach to the workshop.

The idea of the workshop was to engage young children to think about their surroundings and how to better them to something they wanted. - Our goal for the workshop was to create an understanding of how we as adults can create engagement with children

The following will be an introduction to our workshop at Skødstrup School, held on April 18th. The starting point for this workshop was to explore how children can work creatively and productively with Artificial Intelligence through 'UrbanistAI'.

The process leading up to this consisted of a transregional co-designing process which was done through multiple bootcamps with the different partners and co-pilots in UrbanTestbeds.JR. This included Hamburg, Luleå, Aarhus and DOKK1. This approach was a co-designing-process to the workshop where we, as a transregional team build on our competence for the best approach to the workshop.

The idea of the workshop was to engage young children to think about their surroundings and how to better them to something they wanted. - Our goal for the workshop was to create an understanding of how we as adults can create engagement with children

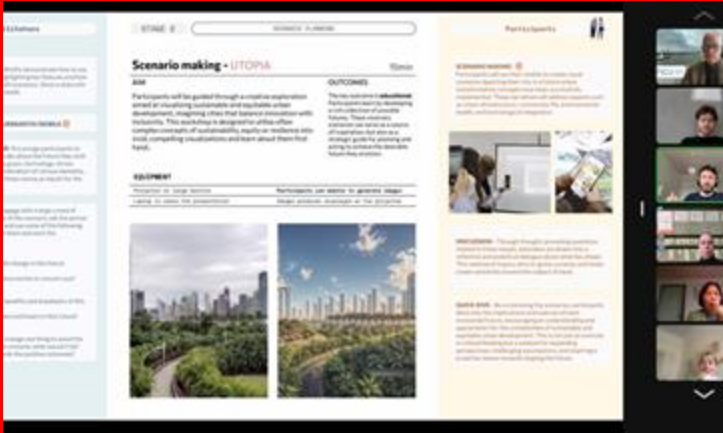


Fig. 1: Sample picture

The picture above is a screenshot from one of the aforementioned bootcamps before the workshop.

- Location:** Skødstrup, Aarhus, Denmark
- Date:** 18 April 2024
- Number of Attendees:** 40
- Age of Attendees:** 9-12

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI

The Workshop was structured as shown below

- Before the workshop
  - first the students Selected a relevant location in the city that they would like to 'improve'
  - We, as the hosts, took pictures of the selected places and created 'wondering'-questions that can get the thoughts going regarding the observations.

The workshop was structured into to parts. First a part where the children, on the day revisited their chosen place. And a second part hosted by us in the classroom.

- The Workshop itself consisted of a:
  - introduction to AI with the focus on Lateral Thinking
  - Work in groups of 3 people
    - Select a relevant image + draw and discuss. Draw on the image what you want to see before you start prompting
    - Prompt until you get the images you want
    - Choose the best of your images
    - Prepare a short story about the image
      - every group come forward and shows their AI-generated pictures and presents their reflections regarding this.



Fig. 1: Sample picture

This figure shows the drawings on the laminated pictures before urbanistai.

**Location:** Skødstrup, Aarhus, Denmark

**Date:** 18 April 2024

**Number of Attendees:** 40

**Age of Attendees:** 9-12

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI



The following will be an dive into our findings and reflections:

The process of prompting children to create something that they, themselves want is more intricate than originally thought. But our findings were that if you created a place where children could think laterally, the process of codesigning in groups became easier. We started to create this Lateral thinking by asking “crazy” questions. This means that the creative process started out with an introduction to AI and AI-photogeneration. This was translated into the visual creative process where the children drew on big laminated pictures so they, themselves could erase it. Thereafter followed a process of prompting UrbanistAI. Here our findings were that simplicity, in the process of prompting created a broader understanding for the goal we were trying to reach. This simplicity created a process where the children could rethink the way, they wanted to think their chosen space.

This co-creative visual process created a democratic aspect in the generation of pictures. The groups were tasked with coming to an agreement. This created group-thinking in ways that the children needed to come to an agreement before they could continue working on their prompt. Therefore it inspired a democratic thinking that everyone had the right to put the mark on the chosen space.



Fig. 1: Sample picture

this is an example of “crazy” questions resulting in “crazy” ai-generated pictures. This is a Cheese-Computer.

**Location:** Skødstrup, Aarhus, Denmark

**Date:** 18 April 2024

**Number of Attendees:** 40

**Age of Attendees:** 9-12

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI

**Our Findings were also, that in the process of creating engagement to things came into mind: Ownership and Responsibility for your idea.**

Ownership over the process and the idea, creates an engagement between the space and the child. This ownership was not directed, but indirectly created through co-structuring and co-creating. This could be done by asking questions that were open therefore the children could find the answers themselves.

The responsibility for the idea is equally important. When you want change in a local area, and you create ideas you are also responsible for those ideas. This means that when the time comes for bringing the ideas into life, means that your idea is your responsibility. Our workshop created ideas that the children had the ownership and responsibility over.

The Teachers from the school wanted to exhibition the creations the children made in the library. It also became material for the student-representatives from Skødstrup skole, to take to the school Board.

One last takeaway was that the children continued working the following days after the workshop, not on any direction from the teacher or us, but by their interest in the subject of creating a better space.



Fig. 1: Sample picture

This figure is an Ai-generated picture of the playground with a zipline.

**Location:** Skødstrup, Aarhus, Denmark

**Date:** 18 April 2024

**Number of Attendees:** 40

**Age of Attendees:** 9-12

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI



School Rothestraße - 3D View



School Rothestraße - Arial View



School Rothestraße – Neighbourhood Map



School Rothestraße – Street Trees Map



School Rothestraße – Street View Google



**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes





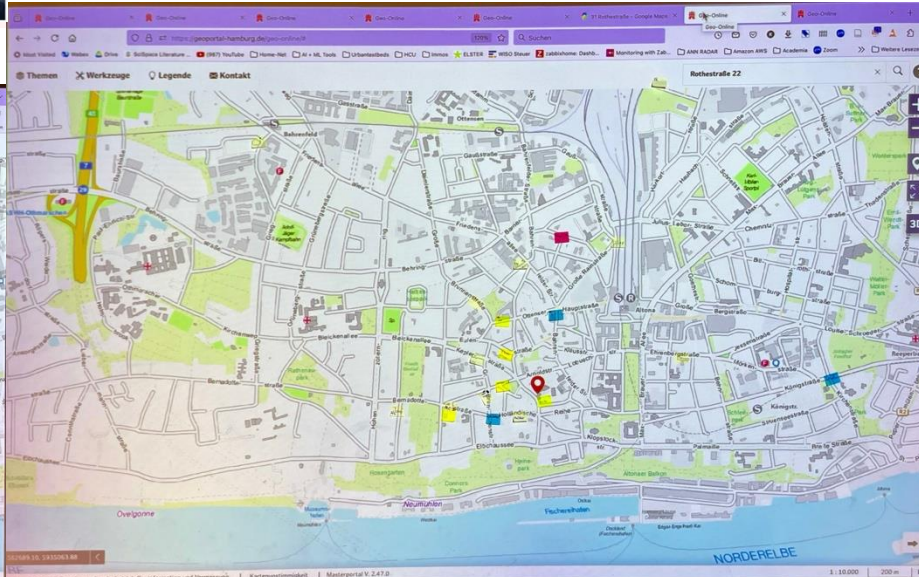
Thinking ...



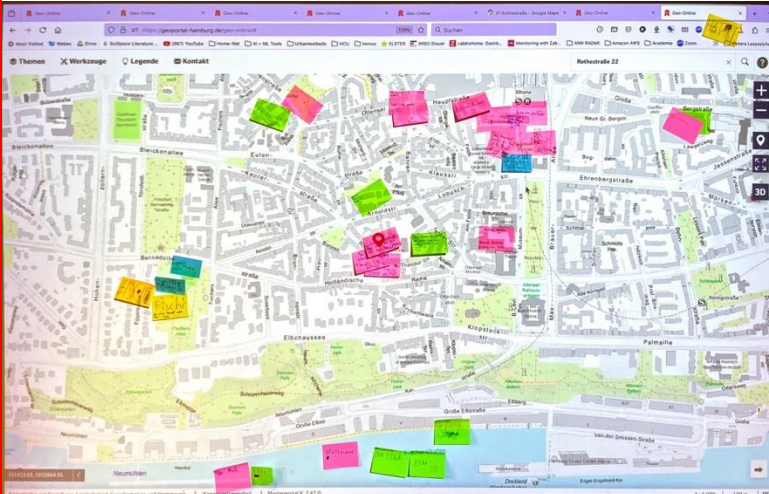
Do you know this tree?



Where do you live?



Where are the places you do not like?



**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes





## Workshop Goals – Part1

Understand children’s concerns regarding their neighbourhood including climate related issues but also liveability and wellbeing. Furthermore, test applicability of spatial planning tools like GIS and specific data layers for the interaction with school children. This includes the capability to understand effectiveness, acceptance and suitability of selected engagement methods for the selected age group.

## Workshop Description – Part 1

We took two steps to engage with the group.

- First, we used the 3D-Model of Hamburg and walked the children through a view of their neighbourhood.
- Second, we used a 2D representation of the same neighbourhood to explore the environment around their school and homes and to other places they frequently visit (e.g. playground, children's museum, school, home, banks of river).

Furthermore, they annotated places they like and they do not like and gave some explanation about the reasons. They put sticky-notes at the projection of the map and explained how they felt about the places and why. So, they could get a feeling of the spatial representation of the map.

**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

### Tools/Media used:

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes



## Workshop Outcomes – Part 1

Initially the children needed a while to locate familiar places and buildings on the map. After a period of observation and explanation by the facilitators they went to the projected map and pointed out places they identified.

Afterwards we asked them to spot their homes. This worked well and they were able to find their homes and while spotting the location they mostly mentioned their home as a location they like (same as the at the previous workshop). This brought us to the next step of the workshop. We asked them to identify places they like and they do not like and put a sticky-note to these locations. After they had become familiar with reading the map they easily found these places and sometimes followed familiar routes on the map (e.g. home to school) to find specific locations where they feel uncomfortable as well as where they enjoy being.

Examples for locations:

- Positive: school (sports facilities), playground, home, park, ice café, funfair, banks of the river
- Negative: school (class room), railway station (trash, dirt, frightening people), trash cans in shopping area and in parks, red light district (frightening people, dirt, trash, graffiti)

**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:**

Geo Portal Hamburg in Web Browser, Projector / Screen + Sticky-Notes







**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI





## Workshop Goals

Create awareness for public space and need to change (e.g. a lot of traffic, noise, little space for people) and think about measures to create a more liveable and human friendly environment.

## Workshop Method

We first explained the scope of the workshop and the steps to follow. After we discussed a little about what makes a city liveable and what may be missing, we introduced the spaces we wanted to work with. One of the two spaces was selected by the whole group. Afterwards the tool UrbanistAI was explained. Then we started the activity following these steps:

- Split audience into 5 groups
- Take the tablet and enter the application urbanistAI
- Enter the creation process by selecting one of three photographs of the space
- Create AI image
- Discuss what you like and what not
- Try again with a changed prompt
- Present your results to the other groups and explain why you selected this image and how you prompted the AI
- Let us create one scenario together. Discuss in your group which elements you would like to add.

We applied three methods of prompting: visual selection of predefined prompts, creating own text prompt, drawing in real world photographs and add desired elements. The drawing was partly handled as a co-creative exercise which created a lot of enthusiasm and joy among the children.

**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI



## Workshop Planning and Materials

Starting with an ideation canvas we created a workshop outline, setting the goals, the theme as well as challenges and opportunities to involve the targeted stakeholders and participants.

The workshop was structured in four main parts:

1. Understanding the need for change in the urban environment
2. Getting familiar with the spaces under consideration
3. Co-Creating scenarios leveraging the tool UrbanistAI
4. Discussing changes and anticipating impact on liveability



**Location:** Hamburg, Germany

**Date:** 05 July 2024

**Number of Attendees:** 22

**Age of Attendees:** 9-10

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI





## Workshop Outcomes

Very similar to our workshop at the university as part of the Young Forum Open City the attending children were capable of understanding and discussing the need for change to create a more liveable and human friendly environment although they were about 2-3 years younger. Besides creating their own images in the smaller groups (3-5 kids) co-creating with the whole group on the projected screen by prompting the AI with drawings was very well received. Interestingly, it triggered a very intense debate about what they wanted and what they disliked about what the next group added to their collaborative work. Additionally, they created less realistic ideas compared to the older group and they tried to trigger the AI to draw some imaginary elements like sports cars or their heroes from video games.



**Location:** Hamburg, Germany

**Date:** 05 July 2024

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**Age of Attendees:** 9-10

**Tools/Media used:** Projector / Screen, Prints, UrbanistAI



*“The idea also becomes much more realistic. And it’s nice that it doesn’t create exactly the picture you envisioned because that helps you come up with other ideas you wouldn’t have thought of.” (participant in the workshop)*

Our idea for the workshop was to replicate the design we used at Skødstrup Skole. This time, however, we wanted the participants to experience what the children did. Our goal was to demonstrate that the same workshop, procedure, and design could be applied in a different setting. We aimed to show the stakeholders the perspective from which the children created, while also encouraging the stakeholders and decision-makers to 'take their own medicine' - to gain a deeper understanding of urban placemaking and testing.

As described in the 'Young Citizen Engagement' section of the playbook, culture can be 'by the children, where children are self-creating culture with or without adult interference, meaning adults guide the process of creation, but children are the decision-makers.' In this workshop, we aimed to build competencies both for ourselves and for the stakeholders, while highlighting the case's connection with real challenges, local action plans and giving the stakeholders an understanding from the design process as a child, creating for another child.



Fig. 1:urban spacee

This is an image of the workshop area with the participants.

**Location:** DOKK1

**Date:** 22. August 2024

**Number of Attendees:** 8

**Age of Attendees:** 25 - 65

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI

*"We had two different focus areas in mind for our workshop. What we thought could be interesting was to see if the participants could discover the potential in AI to generate new ideas—ideas they wouldn't have come up with on their own."*

Our workshop began with an introduction to ourselves and to AI in general, highlighting its strengths and weaknesses in different contexts. The introduction was brief yet comprehensive, providing enough insight into what AI is and what it will soon be capable of.

We then moved on to an observation exercise, where most participants stepped out of the room, paused, and took extensive notes. The majority relied on their sense of sight for observation, while a few engaged more tactilely by interacting with some of the objects.

Next, participants took part in a drawing exercise focused on evaluating and generating ideas for the selected area. This was followed by an AI-prompting session, where participants used Urbanist AI to develop their ideas further. The workshop concluded with participants presenting their concepts.



Fig. 1:urban spacee

This is an image of the introduction.

**Location:** DOKK1

**Date:** 22. August 2024

**Number of Attendees:** 8

**Age of Attendees:** 25 - 65

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI



*“The good thing is that we are close by, so we can walk around and experience the place immediately, and then return. With our impressions of the place, we can start working right away.”*

Our leanings was a followed:

- UrbanistAI only captures a few elements and cannot build upon previous results, which can be a challenge when trying to achieve good outcomes.
- The area masked by the AI can be somewhat limiting. For example, some participants wanted a zip line from the terrace, but this was not possible due to the AI's masking limitations.
- It might be worth considering briefly demonstrating other image AIs, such as Photopea in Skoletube and Microsoft CoPilot.
- The aesthetic perspective in working with image creation became something fun and engaging.



Fig. 1:urban spacee

This is an image of an idea created in UrbanistAI.

**Location:** DOKK1

**Date:** 22. august

**Number of Attendees:** 8

**Age of Attendees:** 25 - 65

**Tools/Media used:** Projector / Screen, Laminated Pictures, Markers, UrbanistAI



**Location:** Hamburg, Germany

**Date:** 10 September 2024

**Number of Attendees:** 30

**Age of Attendees:** 16-17

**Tools/Media used:** Projector / Screen, UrbanistAI

This workshop was embedded into an AI education session for a school class. Starting with general information about AI and its application in various fields as well as ethical and bias issues we used UrbanistAI to provide a hands-on experience for the students.

They explored three different ways of prompting the AI:

- templates/pictures as selection
- text prompts
- drawings by hand enriched by text prompts



## Workshop Goals

Create awareness for public space and need to change (e.g. a lot of traffic, noise, little space for people) and think about measures to create a more liveable and human friendly environment. Explore generative AI and understand different ways of prompting and how this influences the quality of the results.

## Workshop Method

First, we offered some general information about AI and its application before we explained the scope of the workshop and the steps to follow. After we discussed a little about what makes a city liveable and what may be missing, we introduced the spaces we wanted to work with. Then we started the following activities:

- Split audience into 3 groups
- Take the PC and enter the application UrbanistAI
- Enter the creation process by selecting the method to be applied
  - Simple prompting via templates
  - Textual prompting alone
  - "multimodal" prompting using text and drawing simultaneously
- Select one of three photographs of the respective space
- Create an AI image
- Discuss what you like and what not
- Try again with a changed prompt or continue modifying the created image by adding more objects
- Present results to the other groups and explain why you selected this image and how you prompted the AI
- Discuss constraints and shortcomings as well as ethical questions regarding the AI.

**Location:** Hamburg, Germany

**Date:** 10 September 2024

**Number of Attendees:** 30

**Age of Attendees:** 16-17

**Tools/Media used:** Projector / Screen, UrbanistAI





## Workshop Planning and Materials

Starting with an ideation canvas we created a workshop outline, setting the goals, the theme as well as challenges and opportunities to involve the targeted stakeholders and participants.

The workshop was structured in four main parts:

1. Understanding the need for change in the urban environment
2. Getting familiar with the spaces under consideration
3. Co-Creating scenarios leveraging the tool UrbanistAI
4. Discussing changes and anticipating impact on liveability

### A - WORKSHOP IDEATION -

<b>GENERAL INTRODUCTION</b> Write a text that summarises all the other points of this workshop template.  Placemaking 2025: we would like the kids to design spaces with high quality to spend time for meeting friends, relaxing, ...  We use photos from three different public spaces.  Verbal Prompting, Additive Prompting, What do you like, What do you dislike? Use of Visual Library?  Discuss the various visualisations - Voting - Places Discussion	<b>THEME</b> What is the general theme of the workshop? What topic stakeholders should explore?  Urban Greening in city neighbourhoods  Public spaces re-designed as meeting points with little traffic (Rothenburgst., Streimbek, Wandbek)	<b>TIME HORIZON</b> What is the time-horizon of your scenario? What is the year you expect stakeholder to think about for their scenarios?  2025++	<b>IMPACTS / OUTCOMES</b> How will you use the outcome of this workshop to generate impact? How are you going to share the results? Is the main outcome running the workshop itself?  <b>Goal: engagements: how can kids participate in urban co-design?</b>  <b>Outcome: knowledge about engagement</b>
<b>LOCATION/S</b> What are the locations where you intend to run the workshop?  HafenCity University Hamburg, demo center for digital urban planning solutions	<b>STAKEHOLDERS</b> Who are the group of stakeholders invited?  Young Citizens, aged 12-14 (Girls & Boys Day) Academic Institution Cultural Institution	<b>CHALLENGES AND OPPORTUNITIES</b> What are the challenges of your scenarios? What are the opportunities to reimagine a new future?  <b>Challenges:</b> <ul style="list-style-type: none"> <li>- We have 45-60 minutes with two groups</li> <li>- Relevance of places for the participants</li> <li>- Time Horizon</li> </ul> <b>Opportunities:</b> <ul style="list-style-type: none"> <li>- Ability to co-design</li> <li>- Enjoying the low-barrier engagement</li> <li>- Immediate results and responses</li> </ul>	<b>KPIs</b> What are the measurable and quantifiable Key Performance Indicators of this workshop?  <b>Running the workshop as competency building</b>  <b>Multiple visualisations from kids</b>  <b>Voting and discussion protocol</b>

**STÄDTE PLANEN MIT AI**  
Urban Testbeds Junior Workshop zum Girl's & Boy's Day

**Lasst euch inspirieren**  
IDEENFINDUNG MIT HILFE VORBEREITETER PROMPTS/SZENARIEN

**SCHITT 1**  
Jede und jeder wählt 2 Bilder aus

**SCHITT 2**  
Städte für Kinder und Jugendliche?  
Was braucht eine Stadt, damit ihr euch gern darin aufhaltet?

**Welchen Ort wollen wir verändern?**  
AUSWAHL DER PLÄTZE

**Visualisierung mit AI**  
AUS BASIS Eurer IDEEN

1 - Start Bildschirm 2 - Bildauswahl 3 - Ideenwahl  
4 - Generierung 5 - Ergebnisse 6 - Wortung

BILHORNERS PLATZ / ROTHENBURGST.

**Location:** Hamburg, Germany

**Date:** 10 September 2024

**Number of Attendees:** 30

**Age of Attendees:** 16-17

**Tools/Media used:** Projector / Screen, UrbanistAI



## Workshop Outcomes

In contrast to our workshop at the university as part of the Young Forum Open City we set the bar higher for the attending young adults. They were supposed to get underneath the surface of the AI tool and besides understanding the mechanics of applying the AI had to discuss shortcomings and ethical considerations of the AI.

Content of discussion about urban futures and needs

Content of ethical discussion



**Location:** Hamburg, Germany

**Date:** 10 September 2024

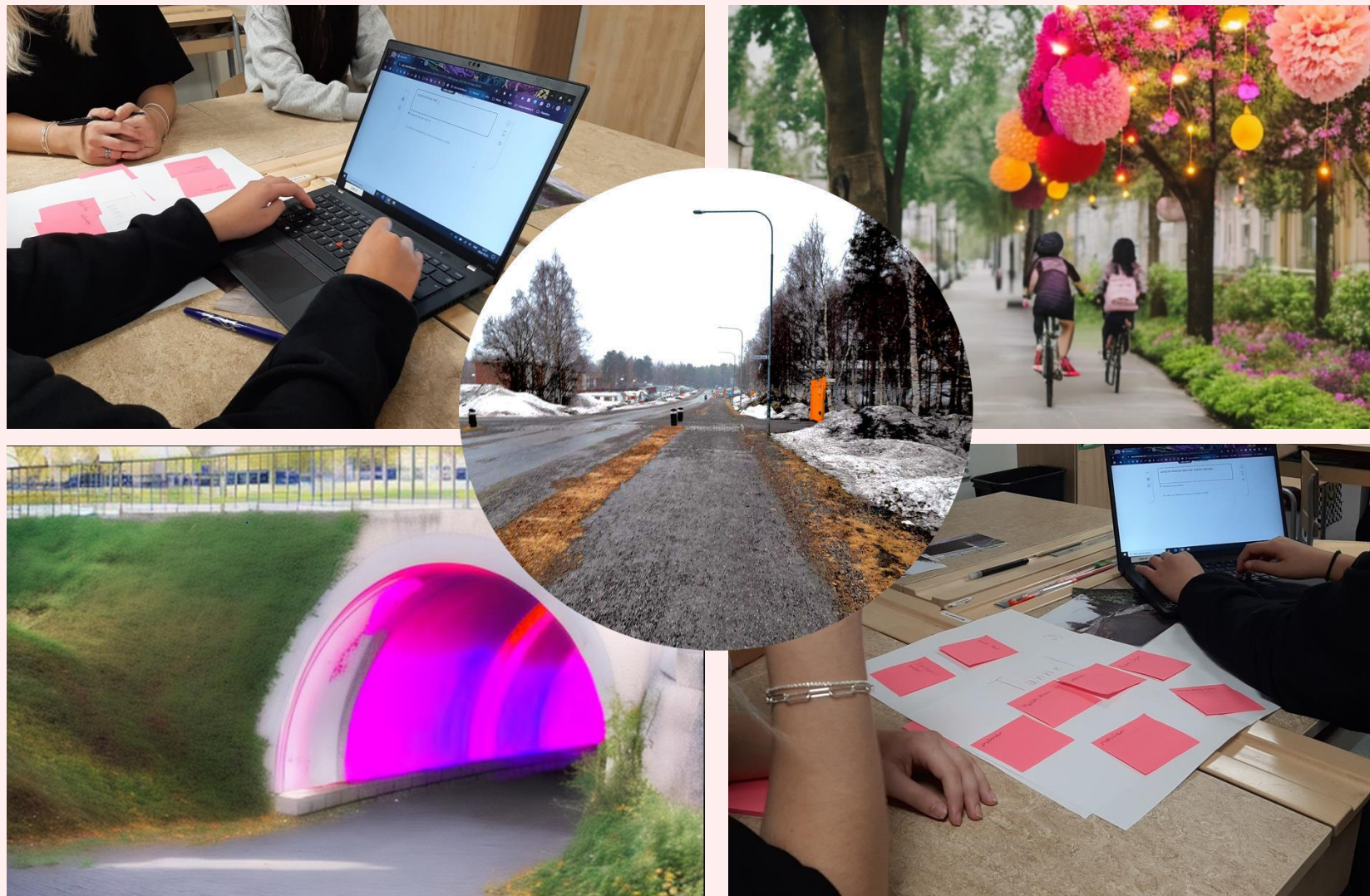
**Number of Attendees:** 30

**Age of Attendees:** 16-17

**Tools/Media used:** Projector / Screen, UrbanistAI







## Goals

Digital citizen participation for active school transportation, i.e., school route, with children using immersive VR in an immersive virtual environment (PACE-SEED).

This is complemented by an AI tool (Urbanist AI) to research how AI can support a digital workshop to let young citizens design their neighbourhood.



## Workshop Goals

Explore the difference between the means of participation with children, i.e., analogue, VR, and AI. Engage children in the urban planning of Hertsön area in Luleå. Compare between analogue, digital, and AI means of engagement.

## Workshop Description

This workshop was organised around three activities focusing on redesigning the children's school route:

1. Previously, the children participated in multiple workshops using analogue participatory methods, including a sensory walk-along, clay, and paper prototypes about the area under construction.
2. Visualize and show the context of the design using a VR tool as a step prior to the design process
3. Design and visualize design for changing the context of the design using UrbanistAI

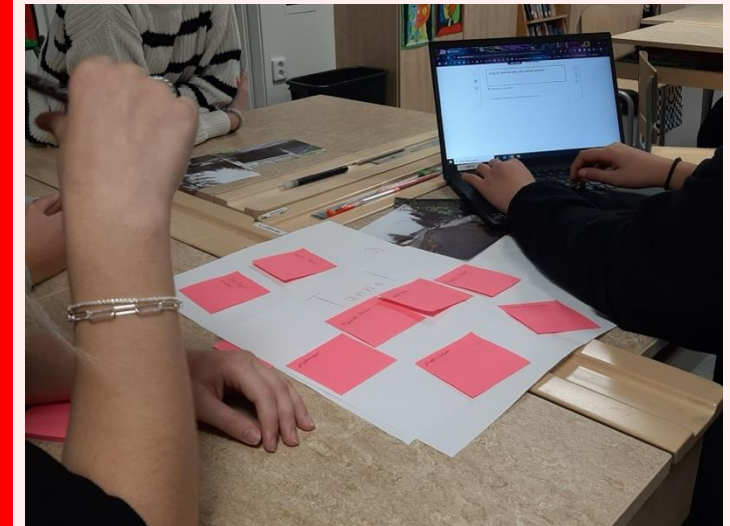
**Location:** Luleå, Sweden

**Date:** 14 & 21 October 2024

**Number of Attendees:** 35

**Age of Attendees:** 12-13

**Tools/Media used:** Laptops, UrbanistAI, Post-it, VR objects (HMD and handheld devices)



## Workshop format

2 students in each group to help both in the AI part and in the VR part and to let them discuss and reflect together. 7 groups (3-4 groups per digital tool)

## Agenda

- 11:30 - Introduce the workshop plan.
- 11:45 - Do one round of VR and AI. One group is doing the AI part, and one group is doing the VR part. Let the students write down comments on the sticky notes. Half the students in one room and half in another room.
- 12:45 - Break. Hand out snacks and drink to let them have a break. This gives them the opportunity to switch from one room to another.
- 13:00 - Do the second round of AI and VR. The “AI group” is designing with VR and the “VR group” is designing with AI. Half the students in one room and half in another room.
- 14:00 - Reflection. Hand out reflection survey that they can answer with help of the sticky note comments.

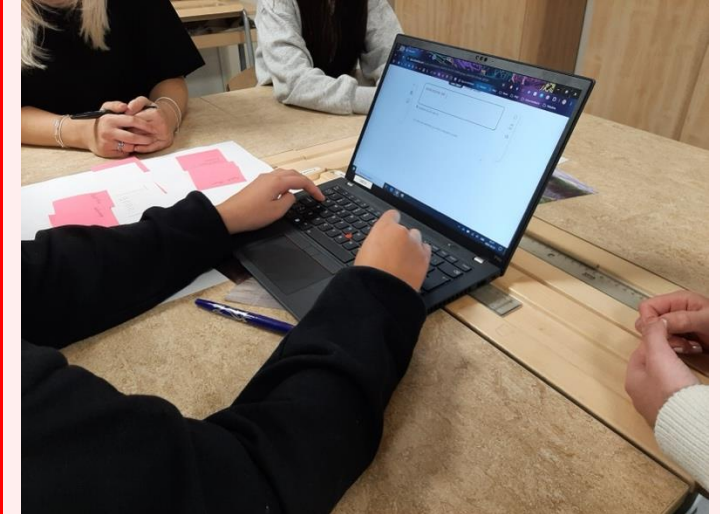
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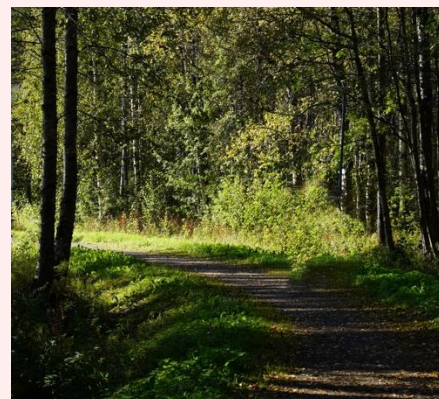
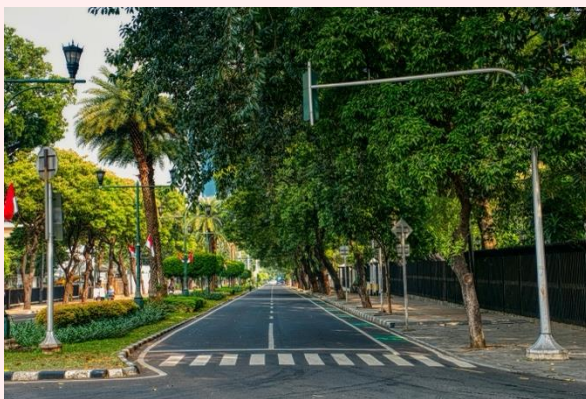
**Age of Attendees:** 12-13

**Tools/Media used:** Laptops, UrbanistAI, Post-it, VR objects (HMD and handheld devices)



## Urbanist AI portion steps:

- 1) The children are divided to discuss pedestrian tunnels, crosswalks, greenways, and sidewalk/bike road.
- 2) Initial discussion about the children's school route.
- 3) Create keywords for UrbanistAI prompts.
- 4) Visualize using UrbanistAI
- 5) Choose favourite generated photos to vote on.
- 6) Vote for top overall photos





## Workshop Outcomes

The children chose their favourite ideas overall and gave reasoning behind that choice. This will be reported back to the municipality to help them in designing the area under construction.

They also gave their reflection about the use of VR and AI for co-design. They enjoyed it, but they were sometimes frustrated that the AI did not produce what they had in mind. This could be attributed to too many keywords used as prompts at the same time.

## Our takeaways from this workshop were:

The variety of participatory methods helps get different insights from the children. It also eliminates the monotony of one participatory method, which might be tedious for the children and hinder their creative process.





# References/Resources



# References (1/4)

## Urban Experimentation

- Knieling, J.; Bley, J.; Hartkop, K.; Wildhack, A. (2022): Experimental Governance for Sustainable Cities and Climate Action – Case Study ANN (A New Normal) RADAR Hamburg. REAL CORP 2022 Proceedings: [https://programm.corp.at/cdrom2022/papers2022/CORP2022\\_112.pdf](https://programm.corp.at/cdrom2022/papers2022/CORP2022_112.pdf)

## Resources

- Geoportal Hamburg: <https://geoportal-hamburg.de>
- Climate Plan Hamburg: <https://www.hamburg.de/politik-und-verwaltung/behoerden/bukea/themen/klimaschutz/klimaplan-und-klimaschutzgesetz>
- Climate Concepts of Hamburg-districts: <https://www.hamburg.de/politik-und-verwaltung/behoerden/bukea/themen/klimaschutz/klimaschutz-in-bezirken-169500>
- ANN (A New Normal) RADAR: <https://iclei-europe.org/funding-opportunities/action-fund/hafencity/>
- Aarhus Urban Data: <https://gisportalen.aarhus.dk/>
- Aarhus Climate Strategy 2020-2030: [https://backoffice.aarhus.dk/media/69807/pixi-strategi\\_uk\\_web.pdf](https://backoffice.aarhus.dk/media/69807/pixi-strategi_uk_web.pdf)
- Aarhus Climate Plan (2021-2024): [https://backoffice.aarhus.dk/media/69806/klimahandlingsplan-2021-2024\\_gb\\_web.pdf](https://backoffice.aarhus.dk/media/69806/klimahandlingsplan-2021-2024_gb_web.pdf)
- Luleå Urban Data: <https://kartor.lulea.se/kommunkarta/>; <https://mal2040.lulea.se/klimat/>; <https://www.lansstyrelsen.se/norrbottnen.html>; <https://ext-geodatacatalog.lansstyrelsen.se/>; <https://www.smhi.se/>
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# Partners

## Associate Partners

**Interreg**  
Baltic Sea Region



**Co-funded by  
the European Union**



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RESILIENT ECONOMIES AND COMMUNITIES

**UrbanTestbeds.JR**

# HafenCity University / Hamburg / Germany



The HafenCity University Hamburg is the University Of The Built Environment And Metropolitan Development (HCU). The education and research at the HCU Hamburg are aimed at contemplating and concretising what the future of metropolitan areas could and should look like. Coping with this future will, however, require a systematic interdisciplinary as well as a transdisciplinary approach. For this reason, the HCU offers the entire range of disciplines required for understanding and designing the urban environment.

HCU initiated UrbanTestbeds.JR, was the lead partner, hosted competency building knowledge workshops and bootcamps, co-created Young Citizens Engagement formats, led the urban data related activities, initiated artificial intelligence applications for the young citizens engagements and orchestrated the development of the playbook

## Use Cases:

- 1 Young Architecture Summer
- 4 Literacies of the Future 6/11
- Digital Neighbourhood
- 7/11 Urban Ideation with Children
- 13 AI for Urban Planning, Young C.



## Role

Lead Partner



We at **DIGTCOM**, from **Aarhus University** work with collaborative research and innovation projects that address the digital and sustainable transformation in cities and communities. Located at the IT campus of Aarhus University, our approach is human centred and ecosystem based. Our ecosystem consists of local and regional partner organisations: municipalities, NGO's, SMEs and industry. On an European and global level, we collaborate on the triple transition (social, environmental and digital) with higher education institutions, research organisations, NGOs, networks, micro companies, SMEs, incubators and industry.

In UrbanTestbeds.JR, we have contributed to Young Citizens Engagement and Workshop Design. Our work has focused on developing a field-based understanding of how to collaborate with young citizens to ideate, understand, and integrate their ideas in meaningful and innovative ways.

## Use Cases:

- 4 Literacies of the Future
- 5 Audiotales Workshop
- 9 Stories for the planet
- 10 Rethinking Children's Spaces
- 12 Rethinking Urban Spaces



## Role

Project Partner



# Luleå University of Technology / Luleå / Sweden



Luleå University of Technology is a public research university in northern Sweden. It is in strong growth with world-leading competence in several research areas. Its total annual turnover is SEK 2 billion, and it has 1,500 employees and 17,900 students.

Luleå University of Technology's Information Systems research subject focuses on the design and use of information technology in relation to humans, organizations, and societies. Our vision is to design and develop knowledge about the digital transformation for a sustainable society, taking our starting point in local conditions to make global impact.

In UrbanTestbeds.JR, we have contributed to the Artificial Intelligence solution scouting, building and application, as well as local and transnational Young Citizens Engagements.

## Use Cases:

- 3 Gamification and Chat bot
- 4 Literacies of the Futures
- 7 Young Forum Open City
- 14 Urban Ideation with School



## Role

Project Partner

# Vidzeme University of Applied Sciences / Valmiera / Latvia



ViA offers high-quality and flexible study programs that successfully balance theory and practice. These are adapted to the current needs of society and changes in the labour market.

The quality of the studies is ensured by experienced and professional teaching staff, advanced study methods, as well as by students who know what they want to achieve and how to succeed.

## Use Case:

8 Solutions created by students to promote sustainability in the city

Knowledge Workshops and Bootcamp



## Role

Associate Partner

# KLICK Children's Museum / Hamburg / Germany



The KLICK Children's Museum in Hamburg's Osdorfer Born district is a space where children and families can explore, experience, and actively shape their world. Interactivity, hands-on learning, and the joy of discovery are at the heart of its mission. Learning is approached as a holistic process that stimulates imagination and creativity while fostering exchange and collaboration.

The museum's exhibitions provide diverse opportunities to engage with themes such as the human body, money, and everyday history in playful and engaging ways.

KLICK combines education and entertainment uniquely. The museum also features a popular children's construction site where young visitors can build real structures.

A key focus of the museum's work is participation. Children are encouraged to contribute their own ideas and actively shape their environments. This emphasis on empowerment is particularly evident in projects centered around architecture and urban planning, as well as in collaborations with local schools and kindergartens. With the new Urbaneo center in HafenCity, this participatory approach will be expanded further, offering young people even greater opportunities to engage, create, and contribute to their urban surroundings.

## Use Cases:

- 1 Young Architecture Summer
- 4 Literacies of the Future
- 6 Digital Neighbourhood
- 7 Young Forum Open City



## Role

Associate Partner



# Teknikens Hus (Science Center) / Luleå / Sweden



Teknikens Hus is the science center of Norrbotten. A vibrant arena where academia, industry, and schools come together. Here, future skills are nurtured, shaped by the world around us. Children and young people engage with their minds, hearts, and hands, fostering curiosity and confidence in the future. Active senses spark interest and inspire hope. The journey into technology, mathematics, and natural sciences often begins here, with children as young as preschool age.

Teknikens Hus was founded in 1988 and welcomes around 100,000 visitors annually, including 17,000 students from the region who receive education from Teknikens Hus's own educators.

Teknikens Hus inspired UrbanTestbeds.JR with their knowledge and Young Citizens Engagement experience, especially using Minecraft as a simulation platform. Minecraft outputs from young citizens can be used as prompting for urban ideation.

## Use Cases:

- 2 Minecraft Hackathon
- 3 Gamification and Chat bot

Knowledge Workshops and Bootcamp



## Role

Associate Partner

# DOKK1 Central Library – IRIS Lab / Aarhus / Denmark



DOKK1 is a public space that functions as a culture house, uniting public institutions like central library, citizen services, and national TV. DOKK1 provides a space for communities, contemplation, learning, and play.

IRIS Lab aims to make Danish children better able to handle modern media and technology. IRIS Lab runs an extensive school-engagement and equips Aarhus' children and youth for an increasingly digital future.

On a visit to the IRIS lab, children and youth will, for example, get acquainted with motion capture, virtual production, podcast or other media they do not have available at schools or at home. IRIS Lab also hosts production workshops for children and youth.

DOKK1 / IRIS Lab engaged in knowledge workshops and bootcamps with UrbanTestbeds.JR and co-hosted and co-facilitated Young Citizens Engagement with urban ideation, as well as corresponding professional competency building.

## Use Cases:

- 4 Literacies of the Future
- 5 Audiotales Workshop
- 9 Stories for the planet
- 10 Rethinking Children's Spaces
- 12 Rethinking Urban Spaces



## Role

Engagement Partner

# Central Library Hamburg / Hamburg / Germany



With over three million visitors a year, the Bücherhallen Hamburg is Hamburg's most popular cultural institution and also the largest municipal library system in Germany. 32 libraries in all parts of the city, two book buses and the central library near the main railway station with an integrated children's and youth library offer a comprehensive, constantly updated range of media tailored to the needs of different guests of all ages and interests.

The central library of Hamburg co-hosted young citizens engagement workshops for digital neighbourhoods and urban ideation.

## Use Cases:

- 7 Young Forum Open City
- 11 Urban Ideation with Children
- 13 AI for Urban Planning with Young Citizens (School programme)



## Role

Engagement Partner



# ARIC Artificial Intelligence Centre / Hamburg / Germany



## ARIC Artificial Intelligence Centre Hamburg

For the targeted promotion and sustainable use of artificial intelligence, it is important to pool expertise across industries and topics. This is done by the Artificial Intelligence Centre Hamburg e.V. (ARIC). The ARIC promotes the future technology of AI in a structured and targeted manner. It acts as a link between application-orientated research and practical application.

Experts from business, science and society have come together in the ARIC to create this central point of contact for AI. The association was founded in September 2019.

In order to have all facets of AI activities and developments on board right from the start, the ARIC brings together AI stakeholders from science and society as well as various economic sectors and company sizes in Hamburg, who contribute their expertise and various fields of action in the field of AI.

### Use Cases:

- 11 Urban Ideation with Children
- 13 AI for Urban Planning with Young Citizens (School programme)



### Role

Associate Partner

AI Sweden is the national center for applied AI, uniting more than 140 partners from the public and private sectors as well as academia. It is funded by the Swedish government alongside public and private partners, with a shared commitment to developing tools and resources that accelerate the use of AI for societal benefit, enhanced competitiveness, and the well-being of everyone living in Sweden.

To achieve these goals, AI Sweden leads projects of national significance in areas such as information-driven healthcare, decentralized AI, edge learning in space, and language models for the Swedish language. Talent development is a priority, with programs, courses, and resources designed to drive organizational transformation. The Data Factory provides partners with access to data-sharing capabilities, computing power, and storage capacity for their AI initiatives.

The AI Sweden network serves as a catalyst for organizations aiming to create sustainable value through AI. Becoming a partner means joining a vibrant Swedish AI ecosystem dedicated to addressing critical societal and business challenges with AI-driven solutions.

AI Sweden is funded by Vinnova and its partners.



**Role**

Associated Partner  
Knowledge and Network Partner

# Coding Pirates Denmark / Aarhus / Denmark



Coding Pirates is a volunteering association that does leisure activities for children and young people (age 7-17) where they can develop their technological daring and creativity.

At Coding Pirates, your child can go to technology and IT, in playful ways. Here, for example, you learn to code your own game and explore and play with a lot of different technologies.

Our pirates learn more about technology and IT through play and creativity. It is important for children and young people that they are technologically formed, so do not hesitate to get your child on board at Coding Pirates.

## Use Case:

Next Generation: Literacies of the Future conference. Co-Hosting of the playfulness workshops and activities.

Knowledge Workshops



## Role

Associate Partner  
(Role Transfer to DOKK1 / IRIS Lab)



# City of Hamburg – Participation / Hamburg / Germany



**Ministry of Science, Research, Equality and Districts**

**Advisory Office (Stabsstelle) Citizens' Participation**

## **Legal framework of citizen participation in Hamburg:**

- **child and youth** participation a **mandatory** responsibility of the administration at the local level (the seven districts of Hamburg)
- with a few exceptions, **adult** participation is a **voluntary** service provided by the administration
- each justified by the presence or absence of passive voting rights (to be able to be elected)

## **Use Case:**

Integration of learnings into the training programme for young citizens participation.

Knowledge Workshops



## **Role**

Associate Partner  
Transfer Partner into the districts

# Aarhus municipality (Aarhus Kommune) / Aarhus / Denmark



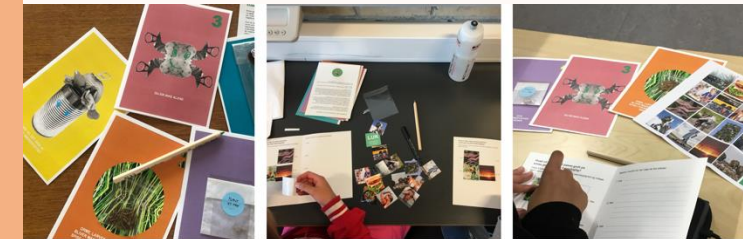
**Aarhus Municipality** (Danish: *Aarhus Kommune*), is the biggest municipality by number of citizens in the Central Denmark Region, on the east coast of the Jutland peninsula in central Denmark. The municipality covers an area of 469.56 km<sup>2</sup> (181.30 sq mi) and has a population of 367,095 as of 2024. The main town and the site of the municipal council is the city of Aarhus.

Aarhus Municipality has for at least the past 10 years been highlighting experimental governance and co-creation with citizens. This also goes for its Climate Strategy and Climate Action Plan, the overall aim of which is for the City of Aarhus – as a Net Zero City - to reach the goal of a carbon neutrality by 2030. Aarhus Climate Action Plans are based in citizens engagement; Aarhus Transitions / Aarhus Omstillers was a first step, with a separate action plan for children and youth and a climate children's organisation going across schools, putting climate change on the curriculum and creating The Green Festival since 2021. Aarhus Transitions has recently transitioned into municipal and citizens engagement in climate change as one of 7 wicked problems which challenge the municipality to work across municipal sections and with citizens to become part of a solution and disseminate Climate Stories. This goes across e.g. ITK (Innovation Technology Creativity), Aarhus Municipality Technology and Environment, Aarhus Municipality Children & Youth as well as Aarhus Municipality Culture, Libraries & Citizens Services.

## Inspirational Case

Aarhus Municipality  
Gør det Samm'n - Do It Together-  
Engagement Principles

Knowledge Workshop



Child participation  
as a method

Cultural Probe with 32 children

- We asked children what sustainability means to them
- Focus on topics that are part of children's lives – nature, waste, food, transport and recycling
- We used the children's answers in the final product to make it more recognizable

**Role**

**Associate Partner**

# Luleå municipality (Luleå Kommun) / Luleå / Sweden

## Luleå municipality (Luleå Kommun)

Luleå Kommun is the municipal organization responsible for managing the city of Luleå, located in northern Sweden. As the heart of the region, Luleå Kommun provides essential public services, including education, healthcare, social welfare, urban planning, environmental protection, infrastructure, and cultural development, for its residents and businesses.

With a strong focus on innovation, sustainability, and digital transformation, Luleå Kommun is committed to creating a vibrant and inclusive community that supports economic growth and enhances the quality of life for all who live and work in the area. The municipality prioritizes collaboration with regional, national, and international partners to develop solutions that address pressing challenges such as climate change, energy efficiency, and urbanization.

Luleå Kommun is also a key driver in promoting the region's role as a hub for technological innovation and data-driven industries. The municipality's efforts to foster collaboration between academia, businesses, and the public sector have positioned Luleå as a leader in sustainable development and digital infrastructure, making it an attractive location for global investment and talent.



Role

Associate Partner  
Transfer Partner  
(with LTU and Teknikens Hus)



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# Supplemental Information

# Experiment 1 - Set Up

## Procedure

Text documents from cities like climate plans were taken and fed into a vector DB as chunks to be matched with questions.

These questions were designed to find out:

- If the LLM finds relevant answers
- If the LLM hallucinates or if it admits that it could not find matching information
- If the answers are consistent and how much variation may occur for asking the same question several times

## Technology

Environment 1 (local application using Streamlit):

- LLM: Open AI GPT
- vector store: FAISS
- Framework: langchain

Environment 2 (Microsoft Jupyter Notebook):

- LLM: Microsoft Open AI GPT35-Test
- vector store: Pinecone

Both are based on this repository: <https://github.com/karlospn/building-qa-app-with-openai-pinecone-and-streamlit/blob/main/Ingest%20data%20into%20Pinecone.ipynb>

# Experiment 1 – Simple questions against climate plans and related documents from one city

## General Information

Experiment Code/No.: HCU-001-Experimenter”

Experimenter: Kay Hartkopf

Date: 01.09.2023

Other related information:

Link to source code of SW used

## Research question

Simple questions against climate plans and related documents from **one city**

- without custom prompt (e.g. role of LLM)

This includes some experimentation with technical parameters like chunk size and overlap for embeddings as well as pre-processing of the documents (e.g. removing special characters)



# Experiment 1 – Technical and data details

## Data / Documents

### Erste Fortschreibung Hamburger Klimaplan (2019) + Anlagen:

d-anlage-1-uebersicht-ueber-klimamassnahmen-2015-2019.pdf  
d-anlage-2-massnahmenprogramm-transformationspfad-waermewende-inkl-gebaeudeeffizienz.pdf  
d-anlage-3-massnahmenprogramm-transformationspfad-mobilitaetswende.pdf  
d-anlage-4-massnahmenprogramm-transformationspfad-wirtschaft.pdf  
d-anlage-5-massnahmenprogramm-transformationspfad-klimaanpassung.pdf  
d-hamburger-klimaplan-2019.pdf

### Szenarienentwicklung Klimaziele Hamburg + Anlagen

d-szenarien-co2budget.pdf  
d-szenarien-ergebnisab.pdf  
d-szenarien-klimaneutralitaetbilanzierung.pdf  
d-szenarien-klimavorbehaltklimacheck.pdf  
d-szenarien-szenarioa.pdf  
d-szenarien-szenariob.pdf

## Technology

### Environment 1 (local application using Streamlit):

- LLM: Open AI GPT
- vector store: FAISS
- Framework: langchain

### Requirements:

langchain==0.0.184

PyPDF2==3.0.1

python-dotenv==1.0.0

streamlit==1.18.1

openai==0.27.6

faiss-cpu==1.7.4

### LLM parameters:

model\_name="gpt-3.5-turbo", temperature=0.8

# Experiment 1 – Sample result

## Question

What projects and measures are planned in Hamburg's climate initiatives to protect and expand urban green spaces and plantings such as street trees?

## Answer

Hamburg's climate initiatives include various projects and measures to protect and expand urban green spaces and plantings such as street trees.

- In a decade, 100 hectares of green roofs are to be built in order to create a new green infrastructure on the roofs.
- There is a green facade strategy to encourage the construction of more green walls.
- The preservation and development of tree populations, especially old urban trees, is important. All districts should designate areas for reforestation and rewetting of peatlands.
- New knowledge about the importance of trees for open space planning is to be developed in order to draw conclusions for Hamburg's urban greenery.
- In the Open Space Quality Offensive, inner-city building space potential is used to upgrade and create open spaces in the district. New parks and green spaces are being created.
- There is a group of experts in collaboration with the Hamburg Chamber of Crafts that implements area-specific structural requirements and conversions as part of climate adaptation.

These projects and measures are intended to help protect and expand urban green spaces and plantings in order to improve the quality of life in neighborhoods and adapt to climate change.