

Co-design game applications and results



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INTRODUCTION

In SmartHubs, design games are developed, introduced, and utilized as co-design tools ([Deliverable 3.4 “Report on recommended co-design technologies.”](#)). Four SmartHubs Living Labs applied their design games and experienced benefits and challenges through their application. The practical use of the design games and the outcomes are observed and analyzed in this document.

METHODOLOGY

All Living Labs were supplied with the same set of gaming materials, such as tokens, cards, dice, and a design game guide, to facilitate the design process within the SmartHubs Living Labs. Each Living Lab partner was tasked with creating their own design games using these materials and the provided guide. ACUR, as the developer of the design game guide, handbook, and materials, supported this process through online meetings and workshops with the Living Lab partners.

Upon the completion of the design process, structured evaluation meetings were conducted with each Lab to gain insights into the development of their respective games. This analysis focused on the processes involved in creating these design games within the Living Labs and the resulting games themselves.

In addition to a series of online meetings that provided support, special evaluation meetings were organized with the Living Labs to gain insights into their entire game design process and progress. These evaluation meetings had a two-part structure: in the first part, the Labs presented their games or their progress, and in the second part, the meetings transitioned into a focus group format. In this structured discussion phase, the design process and the utilization of the materials provided were discussed, following a guideline.

To ensure accuracy and thorough analysis, these meetings were recorded and transcribed. The transcripts, along with materials provided by the Living Labs pertaining to their games, such as photos and individually designed game components, constitute the foundational data for this analysis.

The data analysis process involved several iterative steps, following the thematic analysis method proposed by Braun and Clarke in 2006¹:

- **Initial Game Analysis:** In the first iteration, we examined and described the games themselves. This analysis utilized materials provided by the Labs, such as game descriptions, photos, gaming files, and gameplay documentation. The initial categorization was structured according to the guidelines outlined in the design game guide.
- **Transcription Review:** The second iteration involved reviewing the transcriptions of the evaluation meetings. AI-generated transcriptions were manually cross-referenced with the original recordings to ensure accuracy and facilitate a deep understanding of the content.
- **Coding with MAXQDA:** In the third iteration, the transcribed recordings were coded using MAXQDA. Initial codes were assigned to statements from the evaluation meetings and roughly grouped using color coding.
- **Code Refinement:** In the fourth iteration, the resulting codes underwent a second review and were regrouped to identify the emerging themes within the material.

¹ Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>

- Theme Documentation: The fifth iteration was dedicated to documenting and describing the identified themes. Specific codes were further refined and reallocated to provide a clear and comprehensive representation of the results.

FINDINGS

Each SmartHubs Living Lab created its own design game within the scope of the project (Figure 1). In addition to the analog design games, the developed AR design game was used in one of the Living Labs (Figure 2, Figure 3).



Figure 1: Four design games created and applied in four SmartHubs Living Labs.



Figure 2: AR Design Game supporting the analog board game.

App Elements and Screens

Quit/Exit Game

Quitting or exiting the current game. For rejoining the game another player number needs to be selected.

Character Card

Displays the character card.



Private Elements

Selection of private elements that can be placed virtually by tapping the screen (to token needed). These elements can only be seen by the player (not by others). Can be used for pre-planning.

Player Identification

Player number and colour.

Clear Screen

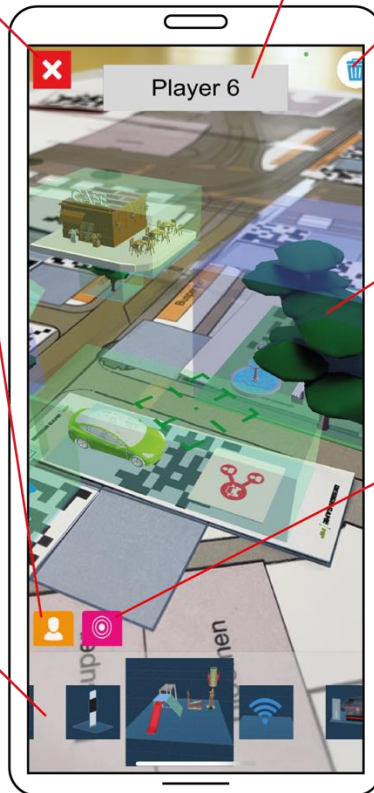
All virtual elements are removed from the screen (without impact on points). Elements can be added again by scanning the codes on the tokens.

Virtual Element

Virtual elements (e.g. a tree) is displayed after scanning the code on the token placed on the gameboard.

Personal Goal Card

Displays the personal goal card.



Gaming Tokens



Action Cards

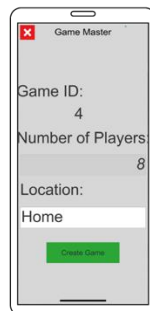
A deck of action cards is displayed by scanning the code on the token. Cards are changed by tapping on the deck.



Score

The score of each player is displayed as well as the total score after scanning the code on the token.

Game Master Screens



Setup

For setting up the game the game master enters a location, hits create game and tells all players the Game ID.



Master View

The game master can take screenshots of the scene by hitting the button. Through tapping „Finish Game“ the master confirms the end of the game.



Deleting Elements

By tapping on an element the game is able to delete elements. Points are reduced for the respective player.

Figure 3: Illustration and description of the AR Design Game App's user interface and features.

In the following some commonalities and differences among these design games will be presented.

The *context and topics* addressed in the Living Labs were deferred by having some commonalities among them: while Eastern Austrian Living Lab was interested in generating ideas to make hubs more attractive through non-mobility services, understanding mobility hubs much more as “places to meet”, Munich Living Lab was focusing on identifying relevant hub elements, both mobility, and non-mobility related. On the other hand, Brussels / Anderlecht Living Lab and Rotterdam / The Hague Living Lab both emphasize the inclusivity of the mobility hub design: it is to design an inclusive and useful mobility hub based on empathy and to raise awareness among citizens by using such elements that enhance accessibility.

The *research questions* asked in the Living Labs were multi-folded by visioning the future of mobility: To design an inclusive mobility hub, it is essential to consider the diverse needs and preferences of different user groups, particularly focusing on elements of importance for mobility and non-mobility aspects. This process entails not only understanding the specific requirements of vulnerable groups but also integrating their perspectives into the design, as their involvement can lead to varied and context-sensitive solutions. Furthermore, enhancing the hub’s appeal through “fun” elements and carefully choosing its location and form are crucial strategies for increasing long-term usage and ensuring that the hub meets the needs of all users in a comprehensive and engaging manner.

Throughout all Living Labs, *actors* who are supposed to participate in co-design activities by means of the design game were citizens, travelers, facilitators, civil society organizations, public institutions like municipalities, transport operators, private organizations, or businesses.

The *framework conditions* of all games were more and less similar: on average 2-4 players and teams are formed to play the games. Max. 30 minutes were planned to finish a game.

Two *narratives* provided by the Living Labs are interesting to mention: coming up with creative ideas to make hubs more attractive through non-mobility services (e.g., events, communication, services, ...) and designing a mobility hub that is of value for different groups.

Different *materials* were used in design games: gameboards, persona cards, personal goal cards, element cards, action cards, money, and scoreboards.

Our Living Labs planned the *mechanics* of their design games by planning dynamics while playing facilitated by setting up the game, rounds including design and evaluation activities by also hosting negotiation and discussion about the actions taken.

CONCLUSIONS

Evaluating the process of developing design games by project partners who are not experienced designers gave insights into possible adaptations of the process. When people were introduced to the idea that each Lab designed a game on its own, and when the packages arrived, they were overwhelmed by the material and found themselves confronted with a task they had no time for and no immediate idea of a solution. Each Lab started a process on its own, somehow led by confusion and overwhelming initially, but quickly led to the structured activities and first results. People reported to have been frustrated, but they also said to be satisfied with the results. Ultimately, each Lab realized a design game that could be played with citizens and (mobility) experts, and produce results for reaching the initially defined goals.

However, the process also showed that the supporting material and approach must be adapted. The material in the box was inspiring at the beginning of the process. Still, the resulting games did not use the materials because the Labs needed tailored material. For giving inspiration, a smaller set of

materials or different types of media, such as pictures or videos, would have been sufficient. Later in the process, the Labs must be supported in crafting tailored materials. The provided guide gave structure to the process and helped the Labs to get an overview of what is needed to design a game, but it needs to be linked better to the material. Examples, practical how-to's, and tutorials need to be included in the guide to better support inexperienced game designers.

The application of Design Games in the SmartHubs project clearly showed its potential to act as a game changer in co-creation processes. A new creative method to understand the needs and wishes of citizens and other stakeholders was introduced to planners. It is still not clear to some of the researchers of this project how to use the Design Games for further analysis and developments within the scope of mobility. In the future development of the Design Games as a methodology, this aspect should be considered explicitly and communicated with the researchers from the beginning of the design and development process. The method supported creative thinking and opened up new perspectives on how to co-create a public infrastructure. Design Games provide a joyfully structured framework for exchanging perspectives, acting in different roles, and expressing arguments. They support an intensive confrontation with a topic and certain tasks deliver clear suggestions directly from players. This leads to serious expectations from citizens. It needs to be communicated transparently and clearly that players' perspectives and ideas are highly valuable but not all collected ideas can actually be realized.

Design Games can easily be generalized and scaled, which might be an additional time-consuming process. Urban authorities and all involved stakeholders should consider the time and effort needed to design, run, and analyze co-creation events by using Design Games. The basic rules and the goals of the game can be applied in many different locations (with similar research questions). The needed effort to adapt the gaming materials to specific locations is low. Elements, persona cards, gameboards, and other materials can easily be tailored to specific locations, contexts, and cultures. This allows the application of Design Game throughout a long period of time in different planning processes, cities, and structures.

The AR Design Game was realized as a simple proof of concept, where many features need to be added to support players, game masters, and other stakeholders on a full scale. Nevertheless, its potential for enhancing gameplay and gathering more detailed digital data for analysis was clearly identified throughout the project.

The evaluation showed that design games are a powerful method for including citizens in decision-making and getting insights into the perspectives of various stakeholders. If non-designers design these games, they need to get the proper support at each stage of the design process. This includes providing the right amount of information at the right point of the process and supporting the designers with high-quality information and materials at the right time. This leads to less confusion and frustration and generates even better and more useful design games.

In the following, the lessons learned from the SmartHubs Living Labs are summarized:

The game facilitates learning and engaging by playing

Through the game, participants acquired new knowledge. It was observed that the game enhanced the engagement of participants, as well as the interaction and discussion among them. The game also gave space to negotiation and conflict, enabling the emergence of opposing views and competing interests. Although the game increased the perceived empathy among participants, certain disagreements remained unresolved. Throughout the game, participants seemed to be increasingly enthusiastic, interactive, and engaged with the activity.

The game is entertaining, simple, and easy to understand

The co-design game was perceived by the players as entertaining and simple, and the game mechanics were easy to understand. Players indicated that the activity was very interactive and they felt very

engaged with the game. The support of the facilitator and the materials provided were considered very useful. When looking specifically at residents and public officials, the results of the assessment remain unchanged.

The game helps equalize participation by mitigating power imbalances caused by participants' prior knowledge, education, and language literacy

It can be concluded that the co-design games helped to reflect and co-create mobility hubs with different stakeholder groups and with several participants belonging to vulnerable groups. The games enabled getting everyone on board to a similar extent, partially overcoming power imbalances related to the previous knowledge of participants, level of education, and literacy of the local language. It can be stated that such games would contribute to the co-creation of inclusive mobility hubs and, to some extent, make mobility hubs a game changer. However, it is important to acknowledge the central role of the facilitators as the output will highly vary depending on this.

Getting vulnerable-to-exclusion citizens to participate is not straightforward

Encouraging residents to participate in a game session (15-30 minutes) during a walk-in, participatory event posed some challenges. Residents, in particular in neighborhoods with a high share of vulnerable-to-exclusion population groups, are not always willing to participate, as they do not immediately see the direct benefit for them. Interestingly, however, in the co-design game played in the Hague, there was not a large difference between the elements chosen by the actual residents and the policymakers using personas.

Most debated elements were related to shared vehicles and cars

The SmartHubs co-design game can be a helpful tool to facilitate a discussion on debated elements, highlighting the perspectives of different residents on, in this case, shared two-wheelers, shared cars, taxi stands, and car parking. The co-design game can help to document the pros and cons of the residents, which can be used as input for the municipality.

The size of elements does not correspond to the real-world situation

With the current size of the co-design game board and elements, participants placed a wide selection of the elements onto the board. In a real-world situation, there would be more discussion and more scarcity of space, and thus more difficult decision-making than during the co-design game. Increasing the size of elements could improve the discussion on space trade-offs.

The game increases the acceptance and knowledge of mobility hubs

The game has the potential to create engagement and acceptance for mobility hubs. People understand why these hubs are needed, and if the main elements are chosen in a way that citizens prefer, implementation could be easier. As the game was rated as “cool and fun”, it can also help to communicate and spread the word about what mobility hubs are and why we need them in our cities.

The game creates awareness

After simulating the game in the role of a vulnerable-to-exclusion person, the player has developed empathy for the elements that vulnerable-to-exclusion users may experience and accepted that the player's main desires may not be a priority. For example, younger people usually tend to choose WiFi as an element of nodes. However, after playing as a vulnerable-to-exclusion person, this element is usually no longer discussed.

The cost of the game is low

The game can be played virtually or with printed cards. The cost generally can be virtually zero.

The results of the game create misleading expectations among players

The idea of the game is that the decision-makers know people's needs. However, people may think that the chosen design is the one that should be built, which may or may not be true.

The duration of the game can be challenging

The game takes about an hour. The game is more suited to playing indoors with a large crowd. If the game is played outside, the game master has to be especially careful with weather conditions.

The game is not a substitute for assessment by vulnerable-to-exclusion persons

It should be emphasized that this game is not a substitute for vulnerable-to-exclusion involvement in the hub planning process.

POLICY IMPLICATIONS

Design games serve as effective collaborative tools, fostering shared understanding among citizens and various stakeholders in urban and mobility planning. When utilized strategically at appropriate stages of an urban planning project, these games can facilitate the exploration, discussion, and negotiation of stakeholders' needs, planners' constraints, and various alternatives and solutions. These insights can then be recorded for immediate application or future refinement. However, it's crucial to manage the expectations of the game participants, particularly the citizens, to prevent any misunderstandings.

COLOPHON

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1.3

WEBSITE

www.smartmobilityhubs.eu

FULL DELIVERABLE:

This text describes the application of co-design game and its results. For the full deliverable D5.6, please refer to: *Tellioglu, H., Mikusch, G., 2024. Co-design game applications and results. SmartHubs Deliverable D 5.6. Available at:*

https://www.smartmobilityhubs.eu/files/ugd/c54b12_2d8735c474194f57b34573c6387bfb10.pdf



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