
LocaLudo: Card-based Workshop For Interactive Architecture

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Abstract

In this paper, we describe the design and outcomes of LocaLudo, a playful and card-based workshop that aims to involve families in the design of interactive architecture. Family members, both children and adults, were invited to build upon local experiences for informing the design of concepts that allow interaction between the house, its residents, and the neighborhood. While the creation of such concepts proved challenging, we found that an open and playful approach, and suggesting the possible use of technologies aided participants in this process. Several recurring themes were identified in the generated concepts: stimulating social contact, spreading information, reacting to negative events, and solving practical problems.

Author Keywords

Codesign; community; workshop; public space; urban informatics; participatory design; playful design.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

In recent years, new sensor and display technologies have been promised to enrich our urban experiences.

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Through their pervasiveness, these technologies are expected to fulfill a meaningful role in bridging the gap between people and their urban environment [4]. As an alternative approach to revealing undiscovered potential of new technologies, we have developed a participatory tool for people to reflect on place and inform the design of technologies for this context.

Inspired by the do-it-yourself movement, we have provided families with an opportunity to explore their street and neighborhood by participating in a playful workshop, and to identify possible opportunities for interactive interventions on their house. These interventions would allow the house, its residents and the neighborhood to interact. This paper describes the development and evaluation of the playful workshop, called *LocaLudo* (*Local* and *Ludic*). In later phases, we will collaborate with a select number of families to further define their ideas and create functional prototypes that can be deployed and evaluated.

Background

In order to explore a neighborhood together with families, we conceived our workshop as a game. Previous research has already highlighted the value of games to inform designs and to serve as a catalyst for participation [3]. The main inspiration for our workshop comes from card-based workshops, which have evolved from being a method for analyzing tasks to being a tool for generating ideas and designing new concepts (e.g. PLEX cards [8], Ideation Decks [6]). These methods rely on physical cards to trigger inspiration and discussion among participants. A notable example is the Inspiration Card Workshop, in which domain and technology cards are used to generate ideas at the

start of a design process with a group of experts [7]. The Instant Card Technique, on the other hand, is meant for a wider range of participants and facilitates the transition from inspiration to concepts by providing a larger variety of cards (e.g. user, location, activity) [1]. These cards contain short descriptions and space for personal notes, thoughts and ideas, ultimately serving as building blocks in usage scenarios for new service ideas and concepts.

Essential to our approach was to ground ideas in their immediate urban context. In this respect, cultural probing has proven to be a valuable method [5]. It is designed to elicit inspiration from personal experiences, and relies on participants to reflect on daily experiences using a variety of tools provided in a 'probe', consisting of, among others, a diary, postcards and instant camera. In a more recent variation called Playful Probing, cultural probes include one or more games that provide opportunities for gathering insights and increasing engagement of participants [2]. The method proved successful in stimulating the design process, yet its implementation remains intensive in terms of time and effort for participants (daily engagement over several weeks) and researchers (preparation and analysis).

Workshop design

LocaLudo is designed as a board game that can be played by 2 to 6 family members, accompanied by at least one moderator (who is not a player in the game). Ideally, participants are 8 years young or older, and have built up a relation with their neighborhood by, for example, being a resident for multiple years. The game is designed to last no more than 90 minutes.

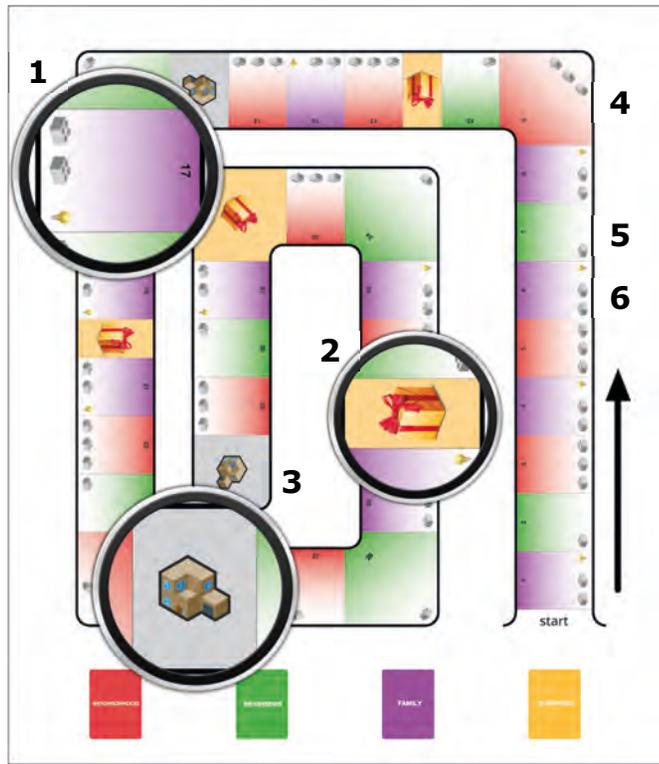


Figure 1. LocaLudo game board with Question tiles (1), Surprise tiles (2) and Concept Phase tiles (3).

Game board design

Similar to Playful Probing [2], we have adapted an existing game and added elements that make the game unique for its purpose. The gameplay is inspired by *Game of the Goose*, a traditional game in Europe. This is exemplified in *LocaLudo* by a game board (Figure 1) with tiles that participants traverse in turn by rolling a dice. Besides the game board, participants are given pens, sticky notes, and a personal pawn. Moderators keep control over scenario sheets, technology and architecture cards and a collection of Lego®-bricks that serve as points.

The board has room for four stacks of cards: Surprise cards, and three types of question cards. These refer to three types of color-coded

Question Tiles ($\{1\}$) on the game board. *Neighborhood Tiles* ($\{4\}$, red) refer to question cards that ask participants about occurrences, frustrations and remarkable events in their street or neighborhood (e.g. "What was the most unforgettable event in your neighborhood?"). *Social Tiles* ($\{5\}$, green) bring up questions that are meant to evoke inspiration from

social interactions within the neighborhood, both positive and negative (e.g. "How do you welcome new neighbors?"). *Family Tiles* ($\{6\}$, purple) motivate family members to reflect on topics that are important in the home (e.g. "What is a commonly discussed topic during family dinners?").

Additionally, *Surprise Tiles* ($\{2\}$, yellow), comparable to "Chance" cards in Monopoly®, trigger a gameplay action to be taken, and thus add a modest amount of excitement (e.g. "Each participant gives you three points."). Finally, *Concept Tiles* ($\{3\}$, gray) trigger an elaborate brainstorming phase as soon as the first participant passes the tile.

Course of a workshop

After setting up the game board, dice, stacks of cards and participants' pawns, moderators introduce the goal and general rules of the game. Participants take turns in a clockwise direction and start turns by rolling the dice. They move the indicated amount of tiles on the board, and perform an action based on the tile they land on. When landing on a question tile, the participant is asked to take the topmost card from the corresponding stack, read the question aloud, answer it, and write down an answer on a sticky note (Figure 2). Answers can consist of sketches, keywords or descriptive sentences, and have a similar function as the instant cards of the Instant Card Workshop [1]. When the participant is unable to think of an answer, other family members can suggest possible answers. When one answer is formulated on a sticky note, the participant is awarded the number of Lego-bricks that is mentioned on the tile.



Figure 2. *LocaLudo*-workshop during questions phase.

When entering Family Tiles, the participant is also given a randomly drawn technology card, which provides basic information about a technology that may serve as a source of inspiration during the game's concept phase. These technology cards are comparable to those used in the Inspiration Card Workshop [7]. Technologies consisted of inputs (e.g. motion sensor, moisture detector) and outputs (e.g. light strip, projector). When a participant lands on a Surprise Tile, he or she

takes the topmost card from the surprise card stack.

At three intervals, when a participant first enters one of the three Concept Tiles, gameplay is halted and a period of collaboration starts (i.e. Concept Phase). Here, participants develop innovative concepts that facilitate interaction with the neighborhood, building upon sticky notes and technology cards that have been collected up to that point in the game. These are related to architectural elements of the house exterior (e.g. mailbox, cornice, front door), presented on architecture cards and drawn randomly from a stack. Participants build upon each other's concepts or suggest new ones, and are free to use any of the cards on the table (not just their own). Moderators can assist by pointing out technologies or answers that can be interesting and discuss the generated ideas. Concepts are written down on scenario sheets that contain an "if ... then ..." structure. Relevant sticky notes are attached to the sheet while the technologies are written down. For example: "if neighbor A [answer to

Neighborhood question] passes by the house, [then] his movements are followed by a light [technology card] attached to the outside wall [architecture card]".

Field study

A total of 10 workshops with individual families took place in 6 different neighborhoods in and around Antwerp, a mid-sized town in Belgium. Ages of participants ranged from 9 to 65. Each participating family took part in one *LocaLudo* game session.

Three out of ten workshops were considered as pilot studies to assess playability, game duration and quality of intended outcomes. Subsequently, changes were made to the final design of the game board and structure of the workshop. Initially, questions were grouped into 4 categories (*people, community, events, family*). During the pilot study, the grouping of some questions proved to be ambiguous, causing confusion over the type of answer to be given. This motivated us to regroup questions into the current 3 categories. During the pilot tests, it became apparent that the game could benefit from clear timing for participants to adhere to. In order to reduce total game duration to 90 minutes or less, the number of tiles was reduced from 70 initially to 40 eventually. Furthermore, developing concepts proved to be time-consuming, as it not only involved discussion among participants, but also motivated participants to relate the concept to the architecture of the house. As a result, the number of Concept Tiles was reduced from four to three.

Results and discussion

In this section, we first describe general observations about the course of the workshops during our field

study. Afterwards, we present an overview of recurring themes in the concepts, along with examples.

Workshop observations

A large majority of participating households mentioned being positively surprised when the game board was set up, having expected a more traditional questionnaire or interview. Participants particularly liked the accessible set of rules that allowed all family members to join. Moderators used the metaphor of a “living house” to frame concepts, and encouraged participants to start from a valuable existing occurrence, actor or sentiment in the neighborhood, and then imagine a new role for their house to influence this. However, because of the novelty of interactive technologies in residential contexts, the concept phase proved to be a complex and time-consuming part of the workshop.

Two elements proved helpful during the concept phase. First, technology cards assisted in making the progress from inspiration to concept less challenging. They inspired participants to explore the possibilities of a certain technology first, and subsequently relate it to one of the answers given during gameplay. Also, technologies allowed participants to expand on an idea by adding a technological component, such as the “printer” card being used to expand on an idea to playfully deter loitering youth, by printing cartoons and other messages for them. Second, animated discussions among participants during concept phases motivated collaboration between children and adults, and created an atmosphere that was open to uncommon ideas. These ideas often originated as ridicule, but could later evolve into serious concepts. One such example is a facade that motivates and

supports neighborhood conversations by providing a light that changes its brightness as more people join the conversation, and an automated umbrella to provide cover from rain and snow. As the first part is certainly feasible, the second is a funny reference to omnipresent rainfall in Belgium.

Concept themes

During the seven workshops that took place after the pilot study, participants developed 26 concepts in total, in which we distinguish four important themes.

SOCIAL CONTACT

Five workshops resulted in concepts that stimulate social interaction between neighbors. Concepts focus on making possibilities for social contact more visible, for instance by playing a tune to announce opportunities for dinner parties with neighbors. Other concepts facilitate shared activities, for instance by providing an automated catering system for aperitifs in the street.

SPREADING INFORMATION

Six of the workshops resulted in one or more concepts that focus on providing usable information to neighbors. Recurring ideas were providing information about local events and showing off hidden talents of neighbors. Small displays were the most common form of providing such information, but some concepts also involved projectors or loudspeakers, for instance in addition to a red carpet for reflecting the mood of a household or announce events in the family.

During two workshops, houses were considered a platform for displaying ambient information, such as a light beacon that signals the arrival of new posters or flyers in the street, or a light strip that indicates an

emergency situation, with brightness, color and animation as indicators of urgency. These concepts work similar to a notification sound or LED on a smartphone, conveying not the information in itself but rather indicating the presence of information elsewhere.

REACTIONARY CONCEPTS

In four workshops, concepts emerged in response to negative stimuli in the neighborhood, such as dealing with speeding drivers through the use of a flashing sign or water balloon cannon. In another neighborhood, the daughter of the family complained about noise, leading to a concept where a LED strip lights up when detecting noise to sensitize people about their noisy behaviour.

PRACTICAL SOLUTIONS

Concepts from four workshops involved solutions to practical problems encountered in the street. These include a neighborhood printer for shared shopping lists, reducing the amount of trips to the shop while assisting elderly neighbors, and a fire alarm that can notify chosen neighbors. Two concepts addressed a lack of parking and playing space respectively by allowing residents to give neighbors permission to use the space in front of their garage or house for these purposes, by (automatically) switching a light on and off. By showing this information in an abstract manner, it would only be "readable" by residents of that street, not by outsiders. In this way, they can help their neighbors while still deciding when their private space can be used.

Conclusion

While games are not new in design contexts, Localudo is unique in the sense that it is a relatively fast method to explore the qualities, concerns and values of a local community, and allows non-experts (residents across

all age groups) to actively take part in brainstorming, bringing their own experiences in and around the neighborhood to the table. By combining this exploration with hands-on concept phases, designers get an overview of latent needs and opportunities for design, in our case involving interactive architecture. Localudo is not a design framework, but a tool for inspiring design, and providing contextualized material for designers to work with. In a next step of our research, we will further collaborate with a number of families to develop their ideas into functional prototypes, evaluating their influence on the residents, neighbors and neighborhood.

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