Exploring Requirements for Joint Information Sharing in Neighbourhoods: Local Playgrounds in The Hague

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Abstract. Resilient communities are an important prerequisite to reach urban resilience. In such communities, citizens need to be able to participate for improving liveability and safety of their environment. The playable city, where participation is key, provides the environment for this process to unfold. This paper researches requirements for the design of playgrounds: environments for open interaction and collaboration, as part of the playable city. Two workshops were organised in two neighbourhoods in The Hague to explore specific citizen preferences for playground design. Neighbourhood locations and the type of information citizens would like to discover, share, and create are identified, in particular with respect to healthcare, safety and social engagement. The implications of these requirements are presented and discussed with design options which exemplify how playgrounds in the city enable joined information sharing, creation, interaction, and collaboration.

Keywords: Community resilience · Interaction design
Playable cities · Playgrounds

1 Introduction

Cities are confronted with major transitions, ranging from the energy transition to the digital transition, from migration to poverty. These transitions mandate the ability of individuals and communities to survive despite the challenges with which they are faced [20]. This ability, referred to as *urban resilience* by the Rockefeller Foundation, is core to their "100 Resilient Cities Network" (100RC). This network helps cities around the world to become more resilient, and explicitly includes social inclusion and cohesion [1] in its goals. As fragmentation of neighbourhoods is one of the major challenges faced by cities [11], this paper focuses on The Hague[1], one of the 100 RC and the most fragmented city in the Netherlands [12, p. 52].

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[1] This paper reports on research performed within the context of the project BART!, that aims to improve coordination and collaboration between citizens, municipality, and police through co-creation, to increase safety and liveability of The Hague.

An important part of The Hague's Resilience Agenda [2] is to empower citizens to engage in finding solutions for the liveability and safety challenges of the city. To this end, citizens need to be able to participate and to jointly share and create solutions for the neighbourhood. The Playable City [15,16], where residents are empowered to participate, is considered to provide the setting for such local engagement. This paper proposes the design of "playgrounds" as part of the playable city: physical and virtual environments where open interaction and collaboration can take place, engaging residents with their local community. On these playgrounds, information sharing, co-creation, and spontaneous social interaction enable citizens to learn about and engage with their surroundings, empowering them to take action to improve their own situation.

2   Related Work

Communities are considered to be one of the core aspects of urban resilience. Their ability to "take collective actions, and to use the available resources to self-organise, respond to, withstand, and recover from crises [8]" is thus a more specific approach to urban resilience.[2] Such *community resilience* is not only supported by the connectedness between neighbours [17], but also by the ability of citizens to influence change or decision-making on local issues of concern [4,14].

In a playable city, technology is often used to offer playful interactions between citizens or with the environment [15] to evoke participatory initiatives from bottom up [16]. Technology, however, is repeatedly used in city making to increase efficiency, leading to less spontaneous encounters and involvement with the direct environment [5,14]. This paper explores whether playgrounds, as part of the playable city, can be created for collaboration and interaction, to open up the opportunity for citizens to participate in the development of their community.

Playful interactions within these particular environments concern citizens jointly sharing and creating local information and stories, aiming to lead to increased involvement for the community well-being [10]. Other types of interactions, such as co-creating the current mood of the neighbourhood [18], tagging specific locations to share with other residents [3,7,13], or gamified social interactions taking place at particular neighbourhood locations [5,7,9], are also potential enablers of a playground. This research explores the requirements for the design of playgrounds for joined information sharing and creation, as an enabler of the playable city.

3   Method

As this research aims to find requirements for open, interactive environments for participation, a playful and participatory approach was used in this exploratory

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[2] Note that this paper does not focus on resilience towards crises as in shocks, but rather on the ability of communities to respond to long-term crises/challenges and trends as they emerge.

case study. Two neighbourhoods in The Hague were selected and residents were actively approached for participation, to make sure the identified requirements would be suitable to their specific situation. Two workshops were organised with citizens in these two neighbourhoods, to investigate which information they would like to share, receive, and create, on which topics. They also explored which locations would be most appropriate for open interaction and collaboration. The aim of these workshops was to acquire insight in requirements for the design of a playground, as the initial basis for the design of an intervention in these neighbourhoods.

3.1 Participants

Purposive sampling [19] was used to find citizens for the workshops. The criteria deployed specified that citizens needed to live in one of the two neighbourhoods and be interested in contributing to the quality of life and safety in their own neighbourhood. Six citizens from one neighbourhood attended the first workshop, and 22 citizens from both neighbourhoods attended the second. Citizens for the first workshop were recruited through gatekeepers, such as the community centre. Citizens for the second workshop were recruited through gatekeepers and "Burgernet", a government-run safety alert platform.

3.2 Workshop Procedure

Workshop 1: Identifying Locations and Information. The aim of the first workshop was to identify which locations in the neighbourhood are most appropriate for sharing and creating specific types of information. Two playful prototypes were developed and used as the basis for discussion during the workshop, see Figs. 1 and 2.

Fig. 1. Participants read stories about their neighbourhood.

Fig. 2. Participants are adding locations on the map.

The first prototype, Fig. 1, was a wooden box with sticks on which various stories from the neighbourhoods were displayed. These stories were based on information shared on local social media pages, and both pictures and written text were used to communicate the narratives. Empty sticks were available as

well so that participants were able to add their own stories. Participants could first freely explore the stories and after 10 minutes, discussion was started to focus on the specific neighbourhood needs, expressed by the participants, in relation to the prototype. Thus, which narratives participants found intriguing, with whom they would share these stories and what other stories they would be interested in.

The second prototype was a printed map of the neighbourhoods, see Fig. 2. On the map, specific locations and information were already marked for participants to consider. Materials were provided for them to mark other locations as well. As in the first prototype, participants first worked on this task within the prototype, and discussion followed on which locations were still missing on the map, and why these locations were considered to be appropriate.

Workshop 2: Identifying Scenarios and Information. The aim of the second workshop was to identify which information needs to be shared when and where. In other words, when do citizens want to share information with each other and where. In particular, for example, the question was addressed whether the need for information sharing depends on specific circumstances such as a neighbour asking for help. A digital prototype was developed to explore the influence of context: if and how different scenarios lead, or do not lead, to the need for information exchange between neighbours.

The prototype for this workshop was a digital interactive website, see Fig. 3, and displayed various questions, problems or stories of citizens. These pieces of information relate to the themes of safety, healthcare, and social engagement, and were based on actual challenges and developments in these neighbourhoods, some identified during the first workshop. This information could be sorted by the participants on the basis of specific citizen (personal), topics (theme), or position on a map (location). In addition to being able to view information, participants could also create new information or respond to one of the questions or problems stated on the website.

Fig. 3. Participants are reading and responding to the stories in the digital prototype.

The workshop took place in two rounds with 10 and 12 citizens respectively. Citizens took place behind a laptop in groups of two, and received a brief

instruction on the functionality of the prototype. For about 20 minutes, citizens could interact with the prototype, viewing different questions, stories, and problems of neighbours prepared by the designers, and respond to these online. After that, participants were asked to fill out a questionnaire on the relevance of the information provided.

3.3 Data Collection and Analysis

The discussions during the first workshop were recorded and transcribed for analysis. The transcript was analysed using thematic content analysis [6], by selecting and interpreting quotes that said something about which locations participants found suitable as playgrounds, and what information they perceived appropriate to share. During the second workshop, data was collected through the questionnaire and from the responses written in the website. Each response was interpreted and coded, and the resulting codes were clustered to identify the influence of context on the need for information exchange between citizens.

4   Results

The aim of the workshops was to explore the requirements for playground design: in particular with respect to locations, information, and topics needed to transform neighbourhood streets into playgrounds for participation. These requirements are to provide the basis for the design of an intervention that enables citizens to playfully interact in the playgrounds of their neighbourhood. This section describes the results with regard to locations, information and topics.

4.1 Relevant Locations for Information Sharing

Building on the locations already on the map, participants proposed several other locations to be included: a local theatre, three churches, two mosques, a school, a sports club, the Salvation Army, and a community centre. These were suggested for two reasons. First, these locations have a history - neighbours already gather at these locations for activities of which some are aware. Such location-based information on activities could be shared with more neighbours. Second, the location itself could be of interest to other neighbours. All participants in workshop 1 agreed that this would lower the barrier to explore new neighbourhood places or to meet new people.

Interestingly, three participants mentioned not only wanting to interact with others in locations from their own direct neighbourhood, but also in neighbourhoods they often frequent. For example, neighbourhoods in which their children's schools are situated, neighbourhoods they traverse on an almost daily basis: participants expressed interest in knowing more about these neighbourhoods and their local activities. Therefore, the first requirement for the playground design is that at least two types of locations have to be included: *gathering locations*, where people are already meeting for activities, and *discovering locations*, where an interesting story could be told about.

4.2   Appropriate Information for Participation

The selected quotes about appropriate information to share and create indicated three different types of information. Activities, i.e. information about activities or places for activities (such as community centre), were mentioned 15 times during the discussion. History, i.e. information about the history of the neighbourhood, was mentioned in 7 quotes. Finally, local people, i.e. information about people from the neighbourhood, was mentioned 8 times. All participants from the first workshop agreed that such information contributes to neighbourhood pride, as citizens need to know something about their local area to be proud of it.

During the workshop, the facilitator asked the participants about which stories they would like to add. All participants were reluctant to add something, and needed to be convinced to share their own story or piece of information. The second requirement for the playground is thus that it needs to be inviting for citizens to share, create, and add information on topics such as: activities, history and people.

4.3   Relevant Use Scenarios

Seven different use scenarios were evaluated during the second workshop, and in the themes *safety*, *healthcare*, and *social engagement*. The scenario on safety evoked most responses, 8 reactions. Scenarios about healthcare and social engagement led to less interaction, varying between 3 to 7 reactions per scenario. One researcher analysed the responses and distinguished four main clusters: refer to institutions, offering help, providing tips, and linking residents. Scenarios about healthcare mainly provoked responses belonging to the "refer to institutions" (5 reactions) and "offering help" (5 reactions) category, while social engagement scenarios led to "linking residents" responses. For the safety scenario, participants mainly provided tips (5 reactions) to increase safety and prevent burglaries.

In the survey, 13 participants choose the safety scenario to increase citizen engagement the most in their neighbourhood, 9 mentioned one of the social engagement use scenarios, and only 4 mentioned one of the healthcare use scenarios. To this end, the third requirement for the platform is that local issues or questions, in particular related to safety and social engagement, have to be included to evoke interaction between neighbours.

5   Design Proposal: Playgrounds in the Neighbourhood

The results were translated to three requirements concerning the design of playgrounds for interactive information sharing and creation. This section proposes design options based on the requirements identified in the workshops described above, to be integrated into the playgrounds and that enable neighbours to interact, meet, and share information about the area.

At least two types of physical locations were identified to be suitable for playgrounds: places where people normally come together, and places where

something interesting can be shared (Requirement 1). Second, a need was identified for an inviting playground where citizens are seduced to multiple ways of sharing and creating information: historical, personal, and information about neighbourhood activities (Requirement 2). To evoke interaction, specific local issues or questions need to be addressed, in addition to open-ended narratives about the neighbourhood (Requirement 3).

5.1   Design Option: Augmented Playgrounds with Mobile App

A design option is to enable citizens to connect to local information using their mobile phones. Figure 4 shows an example design: a mobile application that reveals neighbourhood playgrounds when citizens arrive at that particular location. Citizens can interact in the digital environment, by viewing and responding to information and narratives left by others. In this design, they can interact with neighbours who have been at the same geographical location previously or who are still to come. The playgrounds are thus partially physical and partially digital, as the application allows citizens to both interact with people whom are physically present, or with the information they have placed in the digital environment.

Fig. 4. Citizens are persuaded to interact with other visitors of the community centre.

This designs stimulates citizens to explore their own neighbourhood and find playgrounds with information or other opportunities for interaction. For example, at locations where neighbours already gather, citizens could be persuaded to go inside the community centre, learn about the activity programme and interact with neighbours. This playground could thus focus on creating interaction in the physical space with the people currently present.

5.2 Design Option: Physical Playgrounds with Interactive Installations

Another design option is to transform physical locations into playgrounds, by placing an interactive installation at a particular location. Such playgrounds are easily recognised by citizens passing by, and evoke interaction with the people around. Figure 5 shows an example of such an installation, which aims to stimulate playful interaction with provoking questions or statements that residents can respond to by interacting with the machine, or discuss about with others around.

Fig. 5. An interactive, multi-modal installation stimulates playful interaction between citizens.

To provide for playful encounters, the installation offers multi-modal means for interaction. Citizens do not only get a visual representation of opinions of others, but can also listen to the speaker to interact in another way. To input their own opinion, citizens can use touch or record their story with the microphones.

These design options illustrate how playgrounds could be designed to stimulate open information sharing and social interaction between neighbours that usually are not engaged in such activities. These options will be further elaborated in a third citizen workshop, which especially focuses on the interactive installation design, since that was not covered in the current workshops. In the following research phases, the design proposal is further developed and prototyped to be discussed and evaluated with participants from the case study neighbourhoods. The main aim is to create a design that supports participation

and engagement to increase community resilience in particular with respect to the well-being and safety of the local neighbourhood.

6   Conclusion

The aim of this paper is to explore the design of playgrounds that stimulate interaction and collaboration for community resilience. In two workshops with citizens from The Hague, several requirements were identified, concerning suitable locations, information, and topics to convert neighbourhood locations into playgrounds for participation. The results of the workshops illustrate the potential of playgrounds to be places for open discussion, information sharing, and interaction between neighbours, increasing engagement and community resilience. Design options are proposed that fulfil these requirements. In the next stages of this research project, a design that incorporates these options will be detailed and prototyped for evaluation with citizens.

References

1. 100 Resilient Cities: What is Urban Resilience? (2018). http://www. 100resilientcities.org/resources/#section-4
2. AECOM: The Hague 100 Resilient Cities: Preliminary Resilience Assessment. Technical report, Resilient The Hague, Den Haag (2018). http://100resilientcities. org/wp-content/uploads/2018/03/The-Hague-PRA-English.pdf
3. Angus, A., et al.: Urban social tapestries. IEEE Pervasive Comput. **7**(4), 44–51 (2008). https://doi.org/10.1109/MPRV.2008.84
4. Asad, M., Le Dantec, C.A.: Illegitimate civic participation: supporting community activists on the ground. In: Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work and Social Computing, pp. 1694–1703. ACM (2015)
5. Balestrini, M., Marshall, P., Cornejo, R., Tentori, M., Bird, J., Rogers, Y.: Jokebox: coordinating shared encounters in public spaces. In: Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work and Social Computing, pp. 38–49. ACM (2016). https://doi.org/10.1145/2818048.2835203
6. Braun, V., Clarke, V.: Using thematic analysis in psychology. Qual. Res. Psychol. **3**(2), 77–101 (2006). https://doi.org/10.1191/1478088706qp063oa
7. Cila, N., Jansen, G., den Broeder, L., Groen, M., Meys, W., Kröse, B.: Look! a healthy neighbourhood: means to motivate participants in using an app for monitoring community health. In: Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems, pp. 889–898. ACM (2016). https://doi.org/10.1145/2851581.2851591
8. Comes, T.: Designing for networked community resilience. Procedia Eng. **159**, 6–11 (2016). https://doi.org/10.1016/j.proeng.2016.08.057
9. Fonseca, X., Lukosch, S., Lukosch, H., Tiemersma, S., Brazier, F.: Requirements and game ideas for social interaction in mobile outdoor games. In: CHI PLAY 2017 Extended Abstracts, pp. 331–337. ACM Press, Amsterdam (2017). https:// doi.org/10.1145/3130859.3131304

10. Foth, M., Choi, J.H., Satchell, C.: Urban informatics. In: Proceedings of the ACM 2011 Conference on Computer Supported Cooperative Work, pp. 1–8. ACM, Hangzhou (2011). https://eprints.qut.edu.au/39159/1/39159.pdf
11. Gaventa, J.: Representation, community leadership and participation: citizen involvement in neighbourhood renewal and local governance. Technical report, July, Office of Deputy Prime Minister (2004)
12. Jennissen, R., Engbersen, G., Bokhorst, M., Bovens, M.: De nieuwe verscheidenheid. Toenemende diversiteit naar herkomst in Nederland. Technical report, Wetenschappelijke Raad voor het Regeringsbeleid, Den Haag (2018). https://www.wrr.nl/publicaties/verkenningen/2018/05/29/de-nieuwe-verscheidenheid
13. Kleinhans, R., Van Ham, M., Evans-Cowley, J.: Using social media and mobile technologies to foster engagement and self-organization in participatory urban planning and neighbourhood governance. Plan. Pract. Res. **30**(3), 237–247 (2015). https://doi.org/10.1080/02697459.2015.1051320
14. de Lange, M., de Waal, M.: Owning the city: new media and citizen engagement in urban design. First Monday **18**(11) (2013)
15. Nijholt, A.: Designing humor for playable cities. Procedia Manufact. **3**, 2175–2182 (2015). https://doi.org/10.1016/j.promfg.2015.07.358
16. Nijholt, A.: Playable Cities: The City as a Digital Playground. Springer, Singapore (2017). https://doi.org/10.1007/978-981-10-1962-3
17. Putnam, R.D.: Bowling alone. J. Democr. **6**, 65–78 (1995)
18. Scolere, L.M., Baumer, E.P.S., Reynolds, L., Gay, G.: Building mood, building community: usage patterns of an interactive art installation. In: Proceedings of the 19th International Conference on Supporting Group Work, pp. 201–212 (2016). https://doi.org/10.1145/2957276.2957291
19. Teddlie, C., Yu, F.: Mixed methods sampling: a typology with examples. J. Mixed Methods Res. **1**(1), 77–100 (2007). https://doi.org/10.1177/1558689806292430
20. The Rockefeller Foundation, Arup: City Resilience Framework. Technical report, The Rockefeller Foundation, Arup (2014). https://assets.rockefellerfoundation.org/app/uploads/20140410162455/City-Resilience-Framework-2015.pdf