The City as a Playground

Game tools for interactive planning

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The emergence of a data space (Big Data and IoT) and, with it, the proliferation of communication means, led many scholars to describe the city through a series of concepts like the informational city, the intelligent city or the cybercity, all of them being characterized by a strong networked consciousness (Castells, Graham, Boyer). The hypothesis of this paper is that game methodology is now gaining momentum and can act as enabler of smarter communities by an increasing access to data infrastructures. This is why the city can be seen as a series of connected playgrounds where interactive tools can support citizen engagement and decision making processes. It does so by going through relevant theoretical background on gamification in the urban context and best practices, to finally describe two student projects developed at CHORA Conscious City, TU Berlin. The two projects are experimental and explore the capabilities of interactive tools in order to support planning processes.

Keywords: Gamification, Interactive tools, Networked consciousness, Intelligent communities

INTRODUCTION

The implementation of digital communication systems is still happening in a rather top-down approach, as we constantly give our data away to big companies and tech platforms. But this data infrastructure has to be supported by an intelligent community in an active way, since “intelligent cities are equally about knowledge exchange, human skills and innovation support institutions” (Komninos, 2009, p.339). Even more so, we are approaching a time in which we don’t need to add digital in order to describe urban elements and systems, the digital will become an intrinsic part of them and the community needs to be a part of this change, if not even lead it. This is why the term playgrounds was chosen, as playgrounds refer to a sense of community, inclusion and public services. Playgrounds create a safe environment for children to play and make up games as they go, where the rules are adapting to behaviors in feedback loops. By extrapolating this programme to city level, the hypothesis is that game methods can facilitate communication and guide design processes.

It is in this context that the city can be approached as a series of connected playgrounds, where playgrounds should be understood as areas of action, where different players negotiate their resources, but also their desires. The playgrounds can
be physical places, urban systems and infrastructures, where decisions and actions need to be taken, physically, digitally or both. By giving the players an active role in producing but also handling the data, they will function in a networked mode that leads to the possibility of forming a collective intelligence. Therefore, this paper seeks to investigate to which extent games are able to act as individual and collective communicator in urban context, since it resides in the ability of the community to create intelligent environments (Komninos 2013). It will do this by looking at how data/digital tools can render personal and collective experiences more relevant in the process of reading and writing the urban environment.

If the playground can manifest itself both as physical and virtual environments, then a re-thinking of the relation between people and games through the digital filter is necessary.

**GAMES AS METHODOLOGY**

Gaming methods in city planning have been tested for more than half a century now but gaming in the urban context is gaining momentum more and more as research methodology in recent years. Richard D. Duke is one of the pioneers of gaming as research with METROPOLIS. The author himself reflects upon his experience of using gaming as a tool for action in developing countries by expressing the preference for *generic frame games*. Since games generally don’t respond well to other conditions than the ones they were designed for, Duke (2000) sees the frame game as a possible solution for this matter, they are simple and flexible enough to apply to different contexts: “using generic frame games in which appropriate content could be added to a standardized game process and mechanisms” (Duke 2000, p.82). The idea of a generic frame game is very powerful since it addresses a methodology with various actual games as applications. The access to vast amounts of data gives the opportunity exactly for creating many scenarios that adapt to various urban challenges.

Another pioneer in ‘playing’ with data is Buckminster Fuller and his World Peace Game, taking the whole world as playground, seen as the only appropriate scale for tackling global complexity. The idea of such a game was ahead of its time: “In order to have this kind of power, the game needed to have the kind of information and tools for manipulating that information that empowers. It needed a comprehensive database that would provide the players of the world game with better data than their politically elected or appointed counterparts. They needed an inventory of the world’s vital statistics—where everything was and in what quantities and qualities, from minerals to manufactured goods and services, to humans and their unmet needs as well as capabilities. They also needed an information source that monitored the current state of the world, bringing vital news into the “game room” live. None of this existed when Fuller began talking about a world game”[1].

City Matrix is an on-going research project applied to an actual site in the MIT Campus, the Kendall Square area of Cambridge. The project is a part of City Scope theme developed by the MIT Media Lab and led by Kent Larson. Its goals look towards digitizing and democratizing urban planning processes at the same time while keeping an open-source repository.

“CityMatrix was an effort towards evidence-based, democratic decision-making. Its contributions lie in the application of Machine Learning as a versatile, quick, accurate, and low-cost approach to enable real-time feedback of complex urban simulations and the implementation of the optimization searching algorithms to provide open-ended decision-making suggestions. The goals of CityMatrix were:

a. Designing an intuitive Tangible User Interface (TUI) to improve the accessibility of the decision-making process for non-experts.

b. Creating real-time feedback on multi-objective urban performances to help users evaluate their decisions, thus to enable rapid, collaborative decision-making.

c. Constructing a suggestion-making system that frees stakeholders from excessive, quantitative considerations and allows them to focus on the qualitative aspects of the city, thus helping them define and achieve
By using different types of interfaces (online or the TUI) that have the power to gather people in different modes, the project addresses the formation of a networked consciousness through play. Another such initiative is Community PlanIt from Engagement Lab@ Emerson College, led by Eric Gordon. Community PlanIt takes another approach to games by creating clear missions:

“Within a series of time-limited missions, players compete with each other to earn influence in their community to fund local projects. At the same time, they learn about key issues related to the topic of the engagement process, connect with each other, and suggest solutions to problems. Each game culminates in a face-to-face community event, where players meet with each other and discuss the results of the process and next steps with curators of the game and other decision makers.”[2]

Community PlanIt as well has been developed as an online tool as well as facilitating physical encounters for negotiation. Initially it has been applied in cities like Detroit or Philadelphia, and later on in Moldavia, which demonstrates its capacity to adapt to different contexts and very different challenges.

Game design thinking, especially in the context of urban digitization and climate change has been a part of CHORA Conscious City’s research agenda. CHORA Conscious City, led by Prof. Raoul Bunschoten, practices gaming methods as core activity, since they break down complex challenges in order to generate future urban scenarios.

GAME DESIGN THINKING
The research was conducted with help of two student groups as part of different semester courses organised by Chora Conscious City department at TU Berlin. The two student groups had different approaches to game like tools and their application in specific urban contexts, but they both had a generic frame game approach that is adaptable to different situations. They did so by creating tools rather than a specific game. Each of them focused mainly on the following gaming components: visualization, storytelling and mapping.

Customized Collaborative Urban Design
The first group focused on creating a user based information system that would serve as a useful tool for citizen engagement. Just like in the City Matrix project, the final goal is to support collaborative decision making by helping users visualize their choices and evaluate them through a feedback loop. The project works less as a game, more as an interactive tool that aims at testing scenarios for the selected area’s land-use. The method was to collect citizens preferences and map them in an interactive way. This was achieved by overlaying a 9x9 grid over a given playground an existing site in Berlin (Figure 1). The participants were then asked to place the preferred function from a list of nine into each square that are subsequently processed into a ranking system. After the collection of data, The best case scenario is calculated with the help of an eigenfunction (Figure 2). In a later phase of the experiment the results would be visualized with the help of AR technology.

The users were asked to express their preferences regarding new potential functions in the area. Therefore, a focus on the individual experience is relevant, as Lynch argued at the beginning of his book, “Most often our perception of the city is not sustained, but rather partial, fragmentary, mixed with other concerns. Nearly every sense is in operation, and the image is the composite of them all” (Lynch in Neuhaus, p.119). By then collecting these experiences it was then possible to create a collective “function mixer” and display the most desired scenario with the help of the ANOVA statistical system.

This new relation established between digital mapping and digital geographies has the potential to create a community sense. Digital geographies represent a new way of “being” in the world. They are enabled by digital communication and refer to a digital infrastructure in which people and places become (un)linked. It is a socially constructed space, based on the overlapping of geography and technology (Zook
The abstractization of a site in Berlin into a grid and the placement of preferred programme. Source: Bai Nan, Li Jianan, Ding Huichao, Ye Wenqia et al. p.155-156. The digital mapping can be therefore considered a bridge between physical and digital geographies, by connecting individuals with real locations through a digital trace.

This approach has been chosen for two main reasons: first, its rising relevance in the act of planning and designing and second, its relevance as communication tool at the community level and citizen engagement. In both cases, the act of mapping represents a creative process, as it is “building the world as much as measuring and describing it” (Deleuze and Guattari in Corner, p.89). Mapping is being integrated more and more in our daily experience, not only for an individual purpose, but as a participative communication tool at the community level and citizen engagement.

Figure 2 Visualization of the preferred function ranking. Source: Bai Nan, Li Jianan, Ding Huichao, Ye Wenqia
act. Individuals localize places of interest by being in them and sharing them on social media platforms, thus forming a collective map of the city. This collective map may become “a kind of ground up, open-source digital map that is richer and more diverse in themes than the conventional topographic data of government and commercial mapping concerns.” (Zook et al., p.174).

In the second part of the project, the students experimented with city modeling tools that would enable citizen engagement by visualizing the spatial impact of their scenarios. This was achieved by using Processing in order to connect the functions with 3D virtual building models. They have then used Augmented Reality technology in order to display the specific 3D model of the “playground” area and project the possible variations in a spatial configuration. Although still in experimental phase, the advantage of such an approach, like it was proven in applied projects such as Community PlanIt lies in the bottom-up data collection where the citizens can understand and play with their data.

City Planner
The second student group had a more utopian approach of gaming applied in the urban context, where storytelling is used as methodology. City Planner is an urban design game with rules that focuses on developing an ideal city. It takes the player through the story of an urban designer. The game takes into consideration all the elements that make up a city and the synergy between them, bettering or worsening the quality of life according to how the player combines and places these elements. The beta version puts the player in the shoes of a troubled urban designer, who is at the brink of bankruptcy, but has one last project that can save his company. The only problem is that the site for the project is a cursed land. This first version has the player learn about the basics of urban design, as he tries to develop a community in a race against the clock. He will have to learn how to combine the different urban elements to create the conditions for a good quality of life.

The goals of the initial beta version were the following: 1) Preview how systems and services projects will interact with pre-existing cities. 2) Experiencing the future and systems not yet used in the development of utopian or vertical cities, The advantage of this tool is to be able to study the reaction of different services, in a short time scale and without putting at risk the quality of life of people. The three main elements of the game were:

Element B: Housing.

Element C. Infrastructure—water supply, bio-gas supply, waste distribution/collection system, electricity. It provides the opportunity to place these elements in a site and depending on their characteristics react to each other. Simulating the response of users to the set of systems, it will be observed how the quality of life increases or decreases depending on the different combinations that are made.

The group has been using Unity to develop the game. The software enabled them to integrate other 3D modeling software, and offers the possibility to work with real-time Geodata, which can lead to a complex gaming system. Another advantage of the software is that it enables the interaction with data. This is made possible by integrating the 3D model of the city if needed, which can become a very powerful tool as demonstrated during small events in the Conscious City Lab, since people can relate much faster to the physical context and engage more with the game. In this project the experience is rather individualistic but addresses two essential aspects: the educational aspect of design processes and second, the system integration on the playground.

CONCLUSION

In a time where cities don’t know how to deal with such complex data systems, game methods can act as decision support tools. As Eric Gordon stated, games have to be understood as means to re-frame problems [3]. This is why they can be such powerful tools for handling urban complexity. As such, maps and game like tools become communication enablers, platforms for data flow, not in a top-down direction, but rather acting on the community network level.

Due to time constraints of the allocated academic semester the work has remained in experimental phase. The two groups had to explore both themes of urban complexity, and also learning new software such as Unity and its integration capabilities. The limitations lie especially in the fact that they have not been extensively tested outside the academic environment. Even so, it can already be
concluded that games represent a safe environment where urban scenarios can be rolled out. The playground can be then understood as the interface between the people and their cities. Since the projects remained in experimental phase, further research and action regarding the negotiation aspect of gaming is necessary, as it is a part of the larger research agenda of the CHORA Conscious City. While the first group tackled the issue on the data collection level, the second deals with system integration. Further steps in both cases regard the negotiation between different players.

The act of negotiation is essential on playgrounds, as they define a programme where interaction happens both in between the players, but also between players and the artefacts of the playground itself. A playground is by nature inclusive. The interaction that happens takes the form of individual action or collective action.

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