This monograph is prepared by the European Social Fund under the Global Grant funded project "Social Technologies for Development Collective Intelligence in Networked Society" (project No. VP1-3.1-ŠMM-07-K-03-030).

Reviewers
Dr. Dap Hartmann, Delft University of Technologies, Netherlands
Dr. Agota-Giedrė Raišienė, Mykolas Romeris University, Lithuania
Dr. Povilas Aleksandravičius, Mykolas Romeris University, Lithuania

Editor in Chief
Dr. Aelita Skaržauskienė

Authors:
Dr. Jacqui Ewart – 0,4 authorial quires
Dr. Beata Krzywosz-Rynkiewicz – 0,2 authorial quires
Dr. Edgaras Leichteris – 1,6 authorial quires
Dr. Algimantas Mačiulis – 0,6 authorial quires
Dr. Hamish McLean – 0,4 authorial quires
Dr. Algis Mickūnas – 1,7 authorial quires
Dr. Birutė Mikulskienė – 1,4 authorial quires
Dr. Gintarė Paražinskaitė – 0,7 authorial quires
Dr. Žaneta Paunksnienė – 1,2 authorial quires
Dr. Birutė Pitrėnaitė-Zilėnienė – 3,7 authorial quires
Dr. Rasa Rotomskienė – 3 authorial quires
Dr. Aelita Skaržauskienė – 6,4 authorial quires
Dr. Andrius Stasiukynas – 1,2 authorial quires
Dr. Anna Zalewska – 0,2 authorial quires
Dr. Inga Žalėnienė – 0,3 authorial quires
Dr. Michiel de Lange – 0,5 authorial quires
PhD students: Benas Brunalas – 1,1 authorial quires, Laura Gudelytė – 0,7 authorial quires, Marius Kalinauskas – 1,2 authorial quires, Monika Mačiulienė – 1,5 authorial quires, Olga Navickienė – 0,4 authorial quires, Viktorija Stokaitė – 0,6 authorial quires, Rūta Tamošiūnaitė – 0,3 authorial quires, Agnė Tvronavičienė – 0,7 authorial quires, Taurimas Valys – 0,6 authorial quires.

Translated by: Nijolė Burkšaitienė, Alvyda Liuolienė, Viktorija Mažeikienė, Daiva Užpalie- nė, Vilhelmina Vaičiūnienė, Darius Valūnas

Publishing was approved by:
Institute of Communication and Mediation of Faculty of Social Technologies of Mykolas Romeris University in the meeting of 22 January 2015 (Record No KMI-9).
Social Technologies Research programme of Mykolas Romeris University in the meeting of 23 December 2014 (Record No MPK2-11).
Council of Faculty of Social Technologies of Mykolas Romeris University in the meeting of 30 January 2015 (Record No 1STH-21).

All rights reserved. No reproduction, copy or transmission of this publication may be made without written permission of the authors and the publisher.

against cancer by playing a hang-gliding arcade-type of game. During the game, the players glide in space and collect valuable space dust and at the same time identify negative elements in real genetic data. Scientists spend hours and hours to carry out the process; however, if there is a big number of players, such a task becomes a problem which takes just a few minutes to be solved. The game “Foldit” is a protein-folding game, which helped to disclose the structure of enzymes causing a disease similar to AIDS in monkeys’ organisms. Researchers had been trying to solve this problem for 13 years, whereas the players solved it in only three weeks. The game “Planet Hunters” helped to find over forty planets that could be suitable for life. “Galaxy Zoo” allows looking for similarities in galaxies and classifying them according to their type and origin and, thus, creating a huge bank of collective knowledge. These are just a few examples of the existing projects that aim at invoking the players’ potential for solving real problems through collective games. The brilliance of this concept lies in the fact that people participating in the creative process do not necessarily know what important goal they are making a contribution to. Thus, it is likely that it will not take too long for the day to come when games that had been previously considered to be childish entertainment and a careless form of wasting one’s time will with the help of virtual worlds be saving thousands of lives by joining the players’ creative potential.

5.2.3. The Playful City: Using Play and Games to Foster Citizen Participation

Michiel de Lange,
Utrecht University, Netherlands, m.l.delange@uu.nl

Introduction: the playful smart city. Since several decades, the relationship between technology, creativity and city life has been an intimate one. Following “creative city” policies popular in the late 1990s and early 2000s, “smart city” business, policy and design visions have gained considerable traction since the middle of the 2000s. Smart city agendas aim to improve services and liveability through ICTs and supporting infrastructures, such as urban labs, and rapidly gain foothold in cities worldwide. Large tech companies, such as IBM, HP, CISCO, Microsoft, etc., are forming smart city coalitions with municipalities and knowledge institutions. Among the issues that smart city policies seek to address are
mobility, clean energy, water and food production and distribution, health, living and public participation (Hollands, 2008). However, among cities, such as Rio de Janeiro, Barcelona, Amsterdam, Masdar and Songdo, the emphasis and actual implementation of smart city visions hugely differ.

Smart city visions have received wide criticism (see, for example, Greenfield, 2013; Hemment and Townsend, 2013). By and large, these criticisms have focussed on the ill-defined notion of “smartness” in smart city visions, targeted the simplified view of what cities actually are and attacked their a-political technocratic nature. What does “smart” mean and who are actually supposed to be smart? Is city life and the urban experience about control, efficiency and predictability, or about encountering the unexpected and dealing with differences? Moreover, smart city views propose “technological fixes” to complex problems. Many so-called “smart technologies” or smart interventions are implicitly driven by logics of consumption, control and capsularization but do not empower citizens to become active players in their cities (de Lange and de Waal, 2013). The push for safety with CCTV and smart risk assessing algorithms turn cities into places of pervasive control and surveillance. Smart retails solutions, location-based services and predictive algorithms push a consumerist view of urban life. Also, personal mobile technologies foster a culture of capsularization and retreat. When technology-driven solutions ignore active contributions of citizens, they may have adverse effects for urban public life and identities at large.

Alternative notions have been proposed to address these asserted shortcomings, which, among others, are the “playable city” and “playful city”241. In these people-centered views, the issue at stake is how to engage “smart citizens” with their urban environment and each other with the aid of play and games. In this chapter, the author further explores this nascent research and design agenda that connects the world of urban research and design to the world of research and design of play and games. The aim is to contribute to debates about smart cities and smart citizenship through the particular lens of play and games, to provide a typology for analyzing and developing the playful city and to reflect on the strengths and weaknesses of this idea.

241 See, for example, the Playable City program and conference at Bristol’s Watershed <http://www.watershed.co.uk/playablecity>; or the Playful City workshop held in Amsterdam in 2014 <http://www.hetnieuweinstituut.nl/en/international/partner-programmes/asem-international-networking-programme/creative-skills-playful>.
Play and the city: a historical overview. To gain a firmer grasp of play and games as ways to engage people in participatory city making, it is fruitful to trace some historical connections between play and the city. In various ways, play and games have been part and parcel of urban theory and practices since ancient times (see also de Lange, 2009). From Roman “bread and games” (*panem et circenses*) to the present “experience economy” (Pine and Gilmore, 1999), cities have long been conceived as centers of entertainment and fun. The city in this view is the locus for actual playful behavior and activities, and for enjoying games or other forms of entertainment. Second, with the rise of the modern metropolis, people's behaviors and attitudes in public space have come to be understood in playful terms through the use of theatrical metaphors. Theorists, such as Simmel, Goffman and Loïland, argued that urbanites engage in continuous role-playing and information games to deal with life among strangers who meet in highly segmented roles (Simmel, 1997; Goffman, 1959; Loïland, 1973). Third, a historical strand of “ludic architecture” connects play and games to the physical form of the city. After the Second World War, Dutch architect Aldo van Eyck dotted the ruined cityscapes in the Netherlands with outdoor play spaces as a way to counter top-down functionalist planning policies and open up room for people's own creativity (Oudenampsen, 2013). If this historical line connects play to education, civilization and *Bildung* ideals, a related yet distinct fourth strand as about play as downright subversive. The Situationists criticized mass consumer society and sought to reclaim the right to the city through subversive counter-play and everyday spatial tactics, such as *dérive* and *detournement* (Debord, 1955, 1958, 2005; De Certeau, 1984). Recent approaches in the same tradition have focused on subcultural or countercultural urban practices, such as skateboarding or *parkours* (Borden, 2001; Mould, 2009). Fifth, while not strictly playful, key notions from the world of informatics, such as networks, simulation, feedback loops and virtual reality, have come to profoundly influence architectural theory and practice as new ways to imagine, represent and design cities with digital tools (see, for instance, Wigley, 2001; Picon, 2008). Cybernetics and systems theory have been very influential ways of understanding the city as emergent rule-based systems, which can be “played” through creative recombinations and generative, algorithmic, responsive or parametric design (see, for example, Berry, 1964; Beesley...
5. Developing CI Monitoring Technique

and Khan, 2009). Finally, in late capitalism, play has been absorbed by work itself, through the conflation of labor and leisure time and the concomitant ethics of the creative class, hacker ethic, etc. (Rifkin, 2000; Florida, 2002; Himanen, 2001; Scholz, 2013; Fortunati, 2015).

From this extremely compressed overview, several insights can be distilled. Historical conceptions of the “playful city” have existed on multiple levels and in various forms, across spatial, social and mental spheres of urban life. In the majority of these views, there is a clear conception of “smartness” involved in play. However, it is a rather different view of smartness: didactic and self-empowering in Van Eyck’s urban playgrounds, shrewd subversiveness in Situationism’s playful tactics, cleverness and self-confidence in playing information games in role-playing, and of almost demiurgic ambition in parametric design. Note that in some other historical strands sketched above play is equated with mere entertainment and implicitly taken as childish, stupefying or opium for the masses. Another point is that in early modern times the realms of play and everyday life became separated. More recently, they have been (again) understood as inextricably intertwined. This has been largely driven by the advent of digital technologies in the urban realm and the presumed link to creativity and smartness. A final point is that there are salient differences in play and between play and games itself. Following the work of Roger Caillois, several play activities are distinguished, such as competition, chance, pretense and sensory stimulation (Caillois, 2001). In addition, Caillois noted that play attitudes may alternate between spontaneous and intrinsically motivated free play (paidia) to rule-based and goal-oriented gaming (ludus).

In game design too, the city has often been a central source of inspiration. Alternately called pervasive/ubiquitous/location-based mobile/hybrid reality/alternate reality/urban games, a whole genre of games frames the city as a playing board in order to escape the confines of the screen and be played in hybrid physical-digital spaces (de Souza e Silva, 2006; Chang and Goodman, 2006; Montola, Stenros and Waern, 2009; de Souza e Silva and Sutko, 2009). Cities also frequently figure in game design. This may range from representations of particular cities in the US in the GTA series, to simulating the complexities of city-making in SimCity, to playing with the future of a smart city gone rogue in Ubisoft’s Watchdogs. In this chapter, we focus on the question how game designers, artists and architects
have been developing games that center on specific urban problems, and create play experiences that connect people to life in the city and to fellow urbanites. This is a relatively recent area of expertise that connects urban design with developments in the world of game design. Designing games that are not just played for their entertainment value but also for serious purposes is known under such labels as serious games, games for change, applied games, gamification, persuasive games, etc. The differences between these notions will not be discussed here. It suffices to note that while the use of games and play elements to help solve problems appears promising, a careful balance must be struck between simulating “real world” complexity and deliberate simplification, and between leveraging people’s intrinsic play motivations and achieving external goals.

**Levelling city play.** Play and games may foster participation and citizen-driven innovation on various levels. In this analysis, the author will move from the most applied level of using games for actual urban design to playful experiences without any immediate utilitarian purpose.

First, games may be used to engage people in the actual planning and design process itself through simulation, feedback and using outcomes in actual design. An early example from the Netherlands is *Baas op Zuid* (www.baasopzuid.nl, 2002), a project by BBVH architects in collaboration with housing corporations. The online simulation game was used for the redevelopment of two old neighbourhoods in the city of Rotterdam. Players had to make decisions about their neighbourhood. With a limited budget, would they choose more green spaces, more parking spots or more playgrounds? Players immediately could see the consequences of their choices. Outcomes were aggregated and sent to the planners. Not only did this inform the actual design and decision-making process, but inhabitants also acquired a better understanding of stakeholder deliberations in complex trajectories of city rejuvenation. People who normally would not attend a town hall meeting now had a chance to speak up. Still, in this case the professional remained the initiator and there was no far-reaching shift in the relationship between expert and amateur. Moreover, there was no true gameplay involved, except for the immediate multi-sensory feedback on decisions made (for example, seeing less coins or hearing traffic noise).

Second, games allow people to act on a wide range of specific urban issues through role-playing, building trust, forging collaborations and tapping into crowd creativity. An example is *Community PlanIt* (http://
engagementgamelab.org/projects/community-planit, 2011) by Eric Gordon and team (Gordon and Koo, 2008; Gordon, Schirra and Hollander, 2011). Players answer questions and complete missions to earn virtual coins that they can pledge to real-world urban planning causes. Players also earn awards, including bonus coins by participating in in-game deliberations. Through this game, citizens, municipality and other stakeholders take up different yet equivalent roles and collectively try to solve problems. Through team cooperation, these games build trust, which helps to overcome the tension between short and long term interests. Citizens now have become actual agenda-setters and problem-solvers.

Another project from the Netherlands is Rezone the game (de Lange, 2013). Two cultural organizations from the city of Den Bosch, together with a university for applied science’s game design program, developed a game hybrid board/screen game. Rezone consists of a physical board game with 3D printed iconic buildings that represent the neighborhood, an augmented reality layer of real-time information about these buildings projected on a screen, and a computer algorithm programmed to let vacancy spread like a virus around already empty buildings. Players have to salvage real estate from decline by making strategic investments and forging collaborations. Participants adopt one out of four possible stakeholder roles. In the case of vacancy, these roles include proprietor (owner of real estate), mayor (representing the municipality), engineer (urban designer) and citizen (neighbors). The challenge is for players to not just pursue individual self-interest, but to strategically collaborate in order to defeat the system, which is programmed to let the city descend into decay. In a time in which architecture is under pressure – financially, but also with regard to the legitimacy of professional expertise – it is important that new processes are developed that allow citizens to become shared owners of the processes and outcomes of urban interventions. Rezone is an attempt to establish this sense of ownership through intrinsically motivated play and contribute to livable and lively cities. Like most other games, Rezone is a radical simplification of a complex issue. Rezone itself does not provide solutions. What it can do is to put an issue on the agenda, convene various stakeholders around an issue and allow them to discover horizons for action for themselves. When people craft their own solutions, they will have a much stronger sense of ownership over the outcomes. Already one of the largest construction and real estate companies in the Netherlands has shown interest.
Third, games are used to stimulate playful encounters and interactions with other people and places by stimulating serendipity and fun. In *Koppelkiek* (www.koppelkiek.nl, 2009), by social game maker Kars Alfrink, players in a troublesome neighborhood in Utrecht had to execute simple missions by taking a snapshot of oneself, for example, together with someone else and a randomly found number. These pictures where publicly shown in the window of a neighborhood center and acted as a conversation piece between neighbors. This game was explicitly created to promote playful interactions and serendipity. Players were invited to drop their usual defense mechanism and open themselves up. The game, thus, helped to cement social cohesion and trust between neighbors, and re-engage with the urban environment.

Fourth, games are used to foster a “sense of place”, a feeling of belonging and care for the city through emotionally powerful play experiences. An example is the “subtlemob” project *As If It Were the Last Time* (http://wearecircumstance.com/as-if-it-were-the-last-time.html, 2009) by artist Duncan Speakman, in which participants underwent a cinematographic experience in the streets of London. Participants downloaded an mp3 track and received a secret location and time to start the track on a portable audio player. They were divided into two teams. One team received instructions to perform a minimal scene, while the other group listened to a soundtrack and voice-over and became the audience of a filmic scene performed out on the streets. This hardly qualifies as a game, yet it creates a shared playful experience and induces a sense of connectedness. Through a minimal intervention, participants themselves turn the everyday into a magical situation. Playfulness here stimulates affective responses and emotional ties.

These examples are about applying games or play experiences to the urban realm to foster the “playful city”. The reverse also happens: the city itself can be made “playable” in different ways (on the notion of playability, see, for instance, Kücklich, 2004). Two levels can be distinguished: the *procedural* level of designing certain playable urban infrastructures and services, and the *conditional* level of opening up existing urban policies for experiments and creative “smart governance”. At the procedural level, city infrastructures and services (e.g., traffic speed meters, public transport staircases) can be made interactive and gamified to stimulate certain behavior and mentality. A well-known example is the subway staircase turned into a giant live piano as a way to seduce travelers to climb the stairs.
instead of taking the escalator\textsuperscript{242}. At the level of urban governance, there are numerous experiments that aim to open up the city to systemic change by its inhabitants. Innovations in “playing with the rules” and “leveling the playing field” include participatory budgeting, liquid politics, opening data repositories, and urban labs for semi-autonomous innovation. It is important to note the subtle but salient difference between the “playful city”, taken here as the city in which play and games stimulate the smartness of citizens, and the “playable city”, taken here as the city that itself becomes smart at infrastructural and institutional levels.

\textbf{Conclusion: the playful smart citizen.} In summary, some provisional lessons that could influence how we think about, study and design the smart city are formulated. From the brief historical excavation of the relationship between play and the city, it has been shown how “smartness” in play is understood in a variety of ways. The author suggests that thinking and working along the lines of the “playful city” open up a host of ways to conceive “smartness”, instead of just a technologically-driven one. If we want citizens to be smart alongside cities, we need to better understand how people are already smart in a multitude of ways and how we could leverage this to make better and more interesting cities. Also, from this overview, an important consideration has arisen with a more critic’s dimension. Play risks becoming absorbed into goal-oriented utilitarian practices and neoliberal and self-disciplining discourses of labor as play. While this has not received much attention here, this should be born in mind when further studying and design the playful city.

From the analysis of the mentioned examples, it has been seen that stakeholders while playing meet in a joyous atmosphere, instead of intense town hall meetings or around the negotiation table. Playing together allows trustful relationships to form, which allows forging new social ties or solidifying existing ones. Play in itself probably is not enough to solve urban problems, such as vacancy or the lack of ownership and social cohesion. Playing together, however, may act as a catalyst. From the analysis, it has also become clear that urban design no longer is the exclusive domain of architects and planners. Game makers, media artists and app developers too are designers of today’s cities across physical, social and experiential ranges. Cities face ever more complex issues. This requires smart strategies to tap

\begin{footnotes}
\item \textit{Piano Staircase} [interactive], <www.thefuntheory.com>. The notion of gamification has been hotly debated; see, for instance, Deterding, 2011.
\end{footnotes}
into the pool of citizen wisdom and participation. Games and play seem great ways to do so. However, this requires planners to relinquish control, accept uncertain and ambiguous outcomes, and to allow failure to possibly occur.

Games are ontologically ambiguous: they are composed of a set of constitutive rules, a material setting, and actualized through the embodied activities of the players. This is comparable to what architects may recognize as program, design and use, but with a twist. Game designers create rules and settings, yet the game is only actualized by actual players. People playing are not merely end users. They are active participants. They frequently engage in active production and “meta-play”, playing with the (rules of) the game itself. Players subvert original rules, hack, cheat, exchange game tips, create derivatives and tell stories about their own play. According to Dutch historian Johan Huizinga, author of the seminal work *Homo ludens* from 1938, play is not an element in culture, but at the origin of culture (Huizinga, 1955). Play generates culture because it provides room for innovation. Play offers a safe space for experiment and collaborations in which failing does not immediately have grave consequences. Huizinga’s observation that culture emerges from play suggests that these various play interventions discussed above may contribute to a new urban planning culture in particular and participatory urban culture at large (van Westrenen, 2011; de Lange, 2013; de Lange, van Boxmeer and Peters, 2014). Playful citizens then are not passive users of their city, but adopt a more active role as co-creators of their environments or “city hackers”. This way a sense of ownership can arise (de Lange and de Waal, 2012, 2013). Instead of leaving it up to governments, corporations and (design) professionals, citizens in the playful city create their own smart urban culture.

5.3. Experimental Application of the CI Potential Index Methodology

B. Pitrėnaitė-Žilienė, Mykolas Romeris University, Lithuania, birute.pitrenaite@mruni.eu

E. Leichteris, Knowledge Economy Forum, Lithuania, edgaras@zef.lt

5.3.1. The Course and Methodology of the Experiment

To analyse the hypotheses on peculiarities and preconditions for CI development, a scientific experiment was launched alongside with the
REFERENCES


Abs, H. J.; Veldhuis, R. 2006. Indicators on Active Citizenship for Democracy – the social, cultural economic domain. Paper by Order of the Council of Europe or the CRELNetwork on Active Citizenship for Democracy. The European Commission’s Joint Research Center in Ispra, Italy.


Andersen, K. N. 2011. Social Technologies and Health Care: Public Sector Receding, Patients at the Steering Wheel. *Conference proceedings „Social Technologies“, 11.*


References


Collective Intelligence Equally Well Online and Face-To-Face. *PLOS ONE*, 9(12): e115212.


Ferro, L. S.; Walz, S. P; Greuter, S. 2013. Towards Personalised, Gamified Systems: An In-vestigation into Game Design, Personality and Player Typologies. *In


Greenfield, A. 2013. *Against the Smart City (The city is here for you to use Book 1)*. New York: Do Projects.


References


References

Proceedings of the 1st Workshop on Web 2.0 for Software Engineering, pp. 26–30. ACM.
Lietuvos Respublikos Religinių bendruomenių ir bendrijų įstatymas. Valstybės žinios. 1995, Nr. 89-1985
Lietuvos Respublikos Savivaldybių tarybų rinkimų įstatymas Valstybės žinios. 1994, Nr. 53-996.
Lietuvos Respublikos Susirinkimų įstatymas. Valstybės žinios. 1993, Nr. 69-1291


Lietuvos Respublikos Visuomeninių organizacijų įstatymas. Valstybės žinios. 1995, Nr. 18-400.

Lietuvos Respublikos Vyriausybės nutarimas „Dėl visuomenės informavimo ir dalyvavimo teritorijų planavimo procese nuostatų patvirtinimo“. Valstybės žinios. 1996, Nr. 90-2099.


Malone, T. W. 2006. What is Collective Intelligence and What Will We Do About it? Edited transcript of remarks presented at the official launch of the MIT Center for Collective Intelligence, October 13, Cambridge, MA.


Transactions on Human-Computer Interaction (special issue on Social Issues and HCI), 12 (2): 201–232.
Mccann, P.; Ortega-Argilés, R. 2013. Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. Regional Studies, pp. 1–12.


Nielsen, J. Participation Inequality: Lurkers vs. Contributors in Internet Communities. *Nielsen Norman Group* [interactive]. Fremont, 2010 [accessed


Opinion 5/2009 on online social Networking, Brussels, Belgium [2009]


---


References


Salganik, M. J.; Levy, K. E. 2012. Wiki surveys: Open and Quantifiable Social Data Collection.


Editor in Chief Aelita Skaržauskienė


SOCIAL TECHNOLOGIES AND
COLLECTIVE INTELLIGENCE
Monograph

Layout Daiva Šepetauskaitė

SL 585. 02 04 2015.
Number of copies published 100 egz. Order 25 278
Mykolas Romeris University
20 Ateities str., Vilnius
Website: www.mruni.eu
E-mail: leidyba@mruni.eu

Prepared for release by JSC “Baltijos kopija”
13B Kareivių str., Vilnius, Lithuania
Website: www.kopija.lt
E-mail: info@kopija.lt
Printed by JSC “Vitae Litera”
Savanorių av. 137, Kaunas, Lithuania
Website: www.bpg.lt
E-mail: info@bpg.lt