CO-CREATION OF PUBLIC OPEN PLACES.

Practice - Reflection - Learning

Edited by

Carlos Smaniotto Costa, Monika Mačiulienė, Marluci Menezes
and Barbara Goličnik Marušić

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FOREWORD

Co-Creation of Public Open Places.
Practice – Reflection – Learning

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Public open space is a subject that belongs to us all. Every time we leave our homes, our private territory, we enter a space we have to share with others. Public space is the place for social interactions, strengthening sociability and ultimately exercising democracy. As a subject of study, public space has also long been analysed, explored and researched in various ways and under different guises, by planners, landscape architects and designers, anthropologists, social and cultural geographers, and urban historians. They all bring evidence on the role of public space in urban life, in the quality of urban environment and in the construction of cultural identity. Consequently, public space should deserve serious consideration by all - starting with those in charge and who hold regulatory responsibilities for those who use the places and ultimately give them life.

As the UN-Habitat (2015) rightly recognises, a public space represents a key resource for social cohesion, economic development, and in particular liveability in urban settings. Public space is a resource that critically affects community values and positively impacts the quality of urban life. Backed by these premises, this book is about the co-creation of public open spaces, an issue at the core of the C3Places Project. To better understand the process, particularly the values of engaging people in the production of public space, is one of the C3Places' objectives. The project is developing strategies and tools to help increase the quality and responsiveness of public spaces. In this process, the Project also aims to better understand how Information and Communication Technologies (ICTs) can influence co-creation and social cohesion.

The chapters of this book bring science a little closer to the knowledge about the design, production and management of public spaces. 37 authors responded to the Project's call to share experiences, visions and reflections on how co-creation and participatory processes can create possibilities for a sustainable and equitable future.

This book intends to help researchers, governments and community leaders to move from insights to more collaborative actions in two critical ways. First, by providing timely and multifaceted information about the management of co-creation and civic engagement, and flagging the need for future research and experiences. Second, this book intends to identify examples and reflections that outperform in certain dimensions, thus revealing best practices and lessons that can guide policies and programmes in other cases. It is one thing to understand where co-creation challenges lie; another is to address them. To this end, sharing experiences is essential. Two challenges can be pointed out early on. First, councils still consider people as mere "users" and believe they bear sole responsibility for the production of public spaces (delivery, design, maintenance, etc.), despite the wide range of beneficiaries and stakeholders. Second, the rapid pace of technological advancements and the challenge of keeping stride with this rapid pace of new technologies and their potential contribution to increase the divide and inequities.

The lack of engagement and opportunities for interaction pose critical societal challenges. Also, a hegemonic techno-social understanding is an issue in any discussion on mediated public space (Artopoulos & Smaniotto Costa, 2019). As advocated by C3Places, technology is and must be a means to an end, in our case, making cities more liveable and sustainable, and this for all. Taking on these two big challenges that face such a process, i. e. considering people more than mere consumers and addressing digital technology itself not as an end, is the backbone of this book. As the title indicates, this collective work thoroughly covers different co-creation processes that are embracing society in the fight against exclusion and inequities, and many find that technology is a powerful ally.

Rationale of the Project C3Places

The notion of C3Places is based on the premise that public open spaces have many different forms and features, but collectively add huge value to the experience and to the liveability of urban areas. Understanding the public open space can be done from a variety of perspectives. For simplicity's sake, and because it best captures what people care most about, C3Places considers the "public" as a crucial feature of an urban space. A public space has relevant ecological, economic and social benefits which are multifaceted and accumulative, each space contributing to the sociability, aesthetics and environmental mitigation of urban areas. Consequently, public spaces deserve serious consideration by those with regulatory and other responsibilities for their delivery. Despite the wide range of beneficiaries, too often municipalities consider people as mere "users" and assume they bear sole responsibility for the production (design, maintenance, etc.) of public spaces. Citizens, however, are key partners in co-creation initiatives as they have specific resources and competences which are valuable for (re)designing and delivering public services. As Rizzo et al. argue, citizens are essential in the context of a "community of resources" moving

towards a more sustainable, participatory and resilient society. This brings about the concepts of inclusiveness and responsiveness. Responsive space is one that gives a positive perception of a place to the people who live and work around it and which induces people to spend (a long time) there and/or to opt to come again and share the same experiences. Public spaces are common good, everyone should be able and encouraged to use, accept and share them with others – public space has to accept/tolerate even users who for different reasons are still excluded; in their reflection Smaniotto & Patrício call attention to non-desirable users. Exclusion concerns actual and perceived social isolation, as Alves asserts in his essay, the impoverishment of spatial conditions promote alienation between the city and its citizens. Similarly, Almeida, Batista & Lourenço call attention to teenagers as a group of public space users whose needs and ideas is hardly allowed to influence politics for a variety of related reasons or circumstances. The authors see the possibility to overcome such a situation by practicing urban planning thematic workshops as non-formal and interactive education, offering exploration of subjects complementary to the official curricula. The experience with places is highlighted by taking the "classroom" into different locations, experiencing the space- or time-dependent flexibility of activities, among others. Since responsiveness and inclusiveness factors are amenable to change, the Project's findings and the arguments in this book are the strongest evidence that, through co-creation, sustainable improvements can be achieved that also deter the proliferation of deprived places.

Moving forward, C3Places is contributing to a better understanding of mediated public spaces. Digital technologies are opening new perspectives to make public space more responsive, enabling their adaptation to users and situations. This also concerns digitalization; for public space planning, Šuklje Erjavec & Žlender identify criteria to evaluate digital technologies in terms of their characteristics, attributes and values, while Bizjak focuses on the potential of the digital and connected environment for increasing civic participation. This enhances the quality of the space as a public realm. Digital technologies are not new in public space, but they have to be planned – the call is to create interventions to explore new terrain at the intersection of the physical and digital city – but the emergence of hybrid spaces has to be done with the engagement of both users of technologies and public spaces. The C3Places approach offers new lenses, distinct, complementary perspectives on making life in urban settings more sustainable.

In this book, many interesting and diverse examples are given of the advantages of digital advancements, namely by Botteldooren et. al, who combine co-creative processes with the use of technology in the transformation of the urban soundscape, by Almeida & Viana analysing a radio broadcasting programme for increasing awareness of environmental issues, thereby influencing the sense of citizenship, by Duarte & Mateus who reflect on the strengths and weaknesses of a digital tool to increase

citizen engagement, while Ruchinskaya & Lalenis point out the single technology potential to increase community resilience in the public space.

Rationale of the book on THE Co-Creation of Public Space

This book emphasises three issues: practice, reflection, and learning. **Practice** concerns driving actions, identified and analysed experiences that serve as key models, be it enhanced spaces or engaged stakeholders. Skaržauskienė et al. build upon an assessment of knowledge for exploring digital co-creation initiatives to evaluate the digital co-creation to assist leaders, managers and urban planners to generate diverse ideas, improve tools and find new change-enabling resources. **Reflection** is the process of exploring and examining the results and performance of a co-creation process, of drivers' and users' engagement. As Goličnik Marušić & Šuklje Erjavec rightly explain, co-creation is not the search for a final product but a process, a way to come to public spaces that are more responsive and embedded in in the context. Finally, **Learning** refers to knowledge transfer and replication. It can be both a practical example and/or a reflection on the process. Co-creation as Menezes & Mateus point out is an open process of learning, and can be, as Gomes & Pina bring to the discussion, a process that is not agencied or initiated on purpose. Just the fact that people use a place implies they also co-create it.

The main challenge for this book was to select examples, reflect on their achievements in order to enable other councillors, facilitators and researchers to plan for a more liveable urban environment. The chapters address a wide range of experiences, models, and topics in order to foster a wide reflection on the various expressions of public open spaces - as places and ideas, as opportunities to build identity and to express urbanity, for people and for communities. Different perspectives on practice, reflection and learning of co-creation are in play, opening up new possibilities to approach responsible and inclusive public open spaces. This book presents some reflections and experiences on the implications for planning and research practice in which researchers and experts are leading the way. This book taps into their expertise and scholarship. The time is ripe to revisit and freshly interrogate both the notion and the scope of co-creation, of participatory processes as well as the role digital technology plays in a world that has become an urban planet. Our call is to make the social dialogue viable and strengthen citizens' participation in the construction of their environment. Placemaking and open space can be used as empowerment for citizens to engage with their environment, and to challenge the city and its social role (Estrela & Smaniotto, 2019). They can also be a laboratory for ongoing professionals, as Sanches & Ortiz and Ramalhete report on the university's interest in expanding knowledge and action beyond the academic context.

A public open space embodies planning, social, cultural and economic assets defined by the overlapping of multifaceted values produced by people who use and share it,

and benefit from its qualities and features. By extension this makes the call to maintain the commitment to public open space and its key social role. In this respect, municipalities have to be open to people's needs and provide answers to them. Co-creative processes and tactics could be a possible pathway towards more inclusive and responsive public spaces and towards sharing responsibilities when responding to the challenges of building more cooperative and relational governments.

The co-creation of public space requires a willingness to experiment - from all concerned. A co-creation approach should be open to unforeseen or even utopian outcomes, as they still pave the way for generation of ideas and unpredictable possibilities. These are also the cases and the experiences reported in this book – they share not only where more things were allowed but also the barriers encountered - which is a critical first step to solving bottlenecks. The chapters share experiences, issues and insights that can help reinforce a proliferation of co-creation and citizen engagement processes. Hoping that these fall on fertile ground, as it is now more important than ever for cities to develop and implement strategies that are deeply rooted in the local contexts and tackle at the same time inclusiveness and socio-spatial segregation while aiming to improve the quality of life of all citizens. Citizens' well-being and sustainability can be ensured through responsive and inclusive public spaces, as is acknowledged by UNESCO (2011).

The main objective of this work on co-creation experiences is to share and guide the establishment of responsive cities as well as to disseminate, reflect, strengthen and streamline existing initiatives. To this end, the chapters address several ideas and possible courses in people's relationships with places and spaces and digital technology, considering the mutual relation among the spatial physical shapes, spatial organisation, links, natural features, social and cultural values, the variety of stakeholders and different levels of action.

This book is divided into two parts: Part I focuses on **Co-creation and participative processes** and Part II sets the spotlight on **The digital in the production public open spaces**. It starts with an introduction to JPI Urban Europe, the European Joint Programming Initiative that the Project C3Places convinced to provide support for exercising the co-creation of public open spaces. By raising the question **"Urban living labs as the new normal in co-creating place?"**, **Jonas Bylund, Johannes Riegler** and **Caroline Wrangsten** describe the JPI Urban Europe's approach and the role of urban living labs as a way of supporting urban development in sustainable ways. In order to develop this approach in itself, JPI Urban Europe has engaged in dialogue with various parties of the urban research and innovation community, with stakeholders from civil society and public administrations as well as policy makers to shape, at the moment, what JPI Urban Europe considers to be urban living labs 2.0.

While, in the first part, the authors identify good practices towards the production, delivery and maintenance of public space, in the second part, they discuss the efforts made towards co-creation with the support of digital tools. These are, however, not the centre of attention, as the focus is not on the final result but on the process of developing a co-created urban product. Such experiences are beautifully described. They bring to light specific moments and planning challenges that may be ignored in a static process of urban development. The chapters highlight tactical phases and unconventional interventions, and bear witness to the building of communities, as an important step to harnessing their agency to attract and incorporate institutional support for the development of responsive/inclusive public space, and on the flip side for the realization of citizen-initiated developments.

The diversity of experiences and the range of levels of involvement are important issues, but also create a dilemma: it is hard to compare the experiences and the development processes. Each one, however, provided a single seed between initiators and communities that now pose the challenge to make the experiences even more instructive.

Barbara Goličnik Marušić and **Ina Šuklje Erjavec** in the chapter **"Understanding co-creation within open space development process"** examine co-creation as open space planning and design tool. They pay attention to the interrelations among actors in relation to the actual characteristics of the process and roles of the players.

Aelita Skaržauskienė, **Monika Mačiulienè** and **Laura Gudelytè** in their chapter **"Assessing Digital Co-Creation in Urban Transformations: Case of Vilnius"** propose a Digital Co-Creation Assessment Framework which integrates a variety of factors influencing the transformation of open public spaces into co-creative systems. Such framework provides a novel approach to exploring digital co-creation initiatives in urban contexts and allows to define potential areas of improvement.

Carlos Smaniotto Costa and **Catarina Patrício** in the chapter **"The production of public open spaces and the deliberate exclusion of undesirables"** address appropriation and co-creation from another viewpoint, from the perspective of the undesirable and a worrying fact that the deliberate exclusion by design of users in public spaces is a concern for several municipalities.

Manoel Rodrigues Alves, in the chapter **"Public Space, Spaces of Public Domain: icons of a contemporary simulacrum?"** immerses in the multiple contents of a transition era. Contemporary urban territorialities bring new possibilities to issues related to urban morphology, but the latter also confronts itself with a hegemonic global scenario where public spaces are mostly scenographic spaces, for visual consumerism. In these contemporary times, this essay investigates the notion of "in-between" public spaces of otherness.

In the chapter **"Exploring co-creation as a learning process to (re)think public space from a transformative perspective"**, **Marluci Menezes** and **Diogo Mateus** discuss co-creation as an opportunity to carry out planning together with citizens, promoting participation and innovating from the perspective of a learning process, thus contributing to the more collaborative planning of an open and more people - and environment - friendly city.

The chapter **"Participatory design as a tool to create resourceful communities in Sweden"** by **Agatino Rizzo, Björn Ekelund, Jenny Bergström** and **Kristina Ek**, embraces participatory design methods and design thinking to explore the future energy-aesthetics of cities. The authors call the result of this process "resourceful community", which is a vision based on a new understanding of the nexus between energy and society. This new vision aims at steering the current debate on the energy transition towards socially and environmentally just urbanism.

In their contribution, **"Placemaking with teenagers. Experiences driven from thematic workshops on urban planning"**, **Inês Almeida**, **Joana Solipa Batista** and **Filipa Lourenço** address the experiences of engaging teenagers to critically think about city-making processes. In the context of urban planning workshops, they reflect on teenagers' participation in placemaking, comparing researchers' expectations with teenagers' topics of interest, and discuss the opportunities for active civic participation of teenagers.

Débora Sanches and **Sérgio Ricardo Lessa Ortiz** discuss the experiences of a university extension project. As they become involved in organising a co-participatory process with children for the rehabilitation of squares, the students not only gain technical skills by working in "real-life situations" but are also confronted with the local community's practical knowledge, have to act with and plan for society, as the authors state in their contribution **"The design of co-participation processes in public spaces in São Paulo as university extension project: The revitalization process of Dom Orione and Major Freire Squares"**.

Lucas Ariel Gomes and **Silvia A. Mikami G. Pina**, also working in São Paulo, investigated the **"Use and appropriation as the everyday design of public spaces in the Bexiga neighbourhood (São Paulo)"**. The findings of their research suggest that the creative and engaging potential of the public sphere provided by the existing flexible public spaces also fosters the claiming of other public spaces, and can become the seed for further movements towards more public spaces.

Filipa Ramalhete in the chapter entitled **"Producing collaborative public space: the laboratory of intervention in architecture in situ/ experiment"** analyses the role of academic experiences in the construction of collaborative interventions in public spaces. It describes the in situ/ laboratorial experiments

conducted by the research centre CEACT/UAL in the municipality of Almada, Portugal.

In part II, the chapter by **Ina Šuklje Erjavec** and **Vita Žlender** in the contribution titled **"Categorisation of digital tools for co-creation of public open spaces. Key aspects and possibilities"** explore different digital tools available that can suit different stages of the co-creation process to effectively support the spatial planning process. From this base they propose a framework to classify digital tools for co-creation. The proposed categorization is an important step towards enhancing our understanding of the hybrid space that technology advancements are provoking but also to make better use of technology.

Dick Botteldooren, **Toon De Pessemier**, **Karlo Filipan**, **Kang Sun**, **Bert De Coensel** and **Timothy Van Renterghem** argue in **"Modifying and co-creating the urban soundscape through digital technologies"** that the local character and the volatility of sounds – and by extension the soundscape - make them an ideal subject for co-creation and getting citizens involved. Digital technologies have the potential to improve not only the perception of environmental noise, but also the overall user experience and appreciation of a public place.

Tatiana Ruchinskaya and **Konstantinos Lalenis** address **"The effect of public places on community resilience. A case study of the role of social and digital tools in the City of Volos (Greece)"**. The case study reveals that existing social projects are successful in bringing communities and different social groups together for disaster mitigation and collaborative response. This chapter explores the relationship between public urban places and community resilience in the Greek city of Volos and discusses the potential of using Blockchain technology for strengthening community resilience.

Edney Mota Almeida and **Lúcio Hanai Valeriano Viana** have researched how a community radio station can contribute to sustainable urban development. In the chapter **"Technology and community communication: the use of the radio broadcasting as a strategy for urban sustainability"** the authors explain that a broadcasting schedule targeted to raise awareness, to mobilize and to sensitize, placing the common citizen at the centre of the proposals, can create significant impact on solving or reducing the problems related to urban sustainability.

Igor Bizjak in **"Web 2.0 tools as framework for participation and co-creation"** analyses the use of platforms and tools to boost participatory methods in spatial planning processes. Web 2.0 tools can be powerful, among other things, in the communication between their users, according to the author. The more information is available to the public, the greater is its role in participation and decision-making power.

Tiago Duarte and **Diogo Mateus** centre their attention on **"Planning of public open spaces with digital tools – the example of the WAY CyberParks"**. The authors describe the experiences and opportunities that digital technology offers to aid spatial planning, by introducing the monitoring tool WAY CyberParks. This digital tool intends to increase information and knowledge about places, in order to create more inclusive public spaces that correspond to the needs of their users.

The chapters in this book identify and analyse experiences, methods and tools for both research and practice on the socio-spatial dimension of public space. They share the focus on co-creation and participatory approaches and deal with innovative uses of digital technology. Our purpose is to provide planners, scholars and policymakers with ideas on how to engage citizens, how well engaging citizens may achieve the aim of urban social development, and how to generate dynamism. The experiences analysed here may encourage and guide the development of more inclusive and responsive public spaces and therefore support sustainable development efforts. Co-creation, the Project C3Places is confident, is a process that makes social dialogue viable and responds to the challenges of building an inclusive and responsive urban environment.

Having said that it is important to note that the chapters of this book were completed prior to Spring 2020, so their research and insights do not reference the global public health crisis caused by Covid-19. However, in such challenging times the argument for co-creation to increase the potential of public spaces to support a range of inclusive and responsive outcomes is even stronger.

ACKNOWLEDGEMENTS

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Are urban living labs the new normal in co-creating places?

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JPI URBAN EUROPE IN A NUTSHELL

JPI Urban Europe exists to tackle the grand societal challenge of sustainable urbanisation. It involves the collaboration of more than 20 European countries, with their ministries and funding agencies, drawing on national programming to coordinate and shape joint transnational activities. So far, more than 80 projects have been funded by seven joint calls whereof four have been in cooperation with Horizon 2020, with one more in the pipeline, and a few strictly in collaboration between member states. Currently developing collaborations with the Belmont Forum[1] and with China (NSFC), we continue to answer to the spirit of urgency expressed in international policies such as the UN Agenda 2030. As Wolfram et al (2019: 437) points to, many, if not most, of the challenges in the UN Agenda 2030 have to be tackled in urban settings in one way or another. We do this by adopting particularly Sustainable Development Goal (SDG) 11 as a gateway to other SDGs, and by shaping common frameworks, building critical mass in urban research and innovation, and mobilising a broad range of actors. The aim is to support local urban action for experimenting with and testing ways to tackle challenges, e.g. in resource use, mobility, housing, urban liveability, energy, etc. – activities whose ongoing effects result in feedback loops that include international sharing and dialogue on transition pathways. Ultimately, it compiles evidence on how to proceed with urban transformations that align with global goals and targets.

To support local action and urban policy, JPI Urban Europe has adopted a challenge--driven approach to research and innovation in order to avoid the risks of ill-suited solutions developed by research and innovation actors and to take into account challenges as they are articulated by the problem owners. Since 2019, this approach has somewhat merged with a dilemma-driven approach where the 'wickedness' and

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[1] http://www.belmontforum.org

unexpectedness of urban issues is recognised across the complex settings within which urban sustainable development has to be implemented. An urban dilemma is defined as two or more competing goals, such as from stakeholder interests and related strategies, which potentially fail to achieve their aims when implementing one strategy hampers or prevents the achievement of another. In this sense, dilemmas articulate the challenges and wicked problems involved in liveable urban development. The dilemma-driven approach ultimately helps set up a platform where stakeholders can turn distrust and barriers into constructive and trusting, if not emphatic, transition pathways.

WHY ARE URBAN LIVING LABS SO IMPORTANT FOR JPI URBAN EUROPE?

Regarding urban transformations and transition pathways, where inclusive public spaces represent one key concern, urban experimentation is the key practise in urban dilemma situations to co-design pragmatic ways forward. JPI Urban Europe has supported more than 50 urban living labs in European urban settings. These labs have worked with dilemma situations ranging from urban governance, water management and e-participation to mobility management, inter-ethnic co-existence and stakeholder involvement. But there are a couple of more conceptual reasons why we consider urban living labs a kind of flagship among funded urban research and innovation practices.

Firstly, urban living labs is an approach, or set of methods (an umbrella), geared to make change happen in a co-creative way. It is a tool or instrument to change mindsets, processes and material solutions. Urban living labs can change the way we think of and actually practice urban governance. They are experimental approaches to address societal challenges by facilitating co-creation in everyday urban settings. They are spaces to experiment with new policies, co-design and test new methods to tackle specific urban challenges and to explore new governance models outside the conventional research and innovation laboratories (JPI Urban Europe, 2019: 37).

Urban living labs represent a means of collectively working on urban futures that support change and re-doing taken-for-granted practices in an inclusive manner. They are suitable to test and shape new knowledge around new solutions, as well as for translating existing solutions and processes from one urban setting to another. Proper urban living labs are more than simply projects or a collection of cases and examples. Societal sustainability challenges require new, transformed ways of organizing urban life, not just from individual citizens but also, and perhaps more so, from and in our contemporary governance structures and innovation contexts. In view of this backdrop, our position is that urban living labs can be useful and even necessary in urban transitioning, and we identify at least two specific reasons for why urban living labs are important to JPI Urban Europe:

- There is increased fragmentation in urban imaginaries and sectoral lines. Current silo and sectoral approaches risk becoming counter-productive as they

risk generating wicked problems across and in urban settings. Urban living labs provide the means to highlight and tackle these kinds of challenges.

- While linear research and innovation models to tackle societal challenges are inadequate, urban living labs are well suited to work in non-linear urban innovation ecosystems with multi-stakeholder participation and diverse knowledge practices.

CURRENT CHALLENGES

Over the past decade, JPI Urban Europe has, thanks to worthwhile exchange with projects, reflexive research, practitioners and urbanists, uncovered areas for improvement for urban living lab projects and regimes. However, impactful projects have been under way in their specific context and few, if any, urban living labs have made concrete contributions to urban transformation. With regards to the wicked problems that urban areas, and society at large, is currently faced with, urban living labs cannot afford to do 'business as usual.' They must contribute with valuable and long-term actions to urban transformation processes. JPI Urban Europe has thus reached a set of conclusions regarding current challenges in the urban living lab approach:

Equity and inclusiveness

Who benefits from the lab, and who is in the room? Although co-creation and challenges are at the core of urban living labs – a lens of equity and inclusiveness with regards to these areas has been missing.

Integration in local and regional 'proper' governance

Current urban living labs sometimes run in parallel with institutions and governance, instead of in an integrated way. This affects the project's possibility to ensure longer term impact, and to be a resource in governance issues rather than a side runner.

Capacity building in public administrations

Urban living labs need to contribute to public administrations' capacity to work with wicked problems. Learning loops need to guide project developments. To a certain extent, our experiences correspond with those highlighted by Marvin et al. (2018):

- Design: Longer term assessment and comparative analysis of how they are formed,

- Stabilisation and operation: increase conceptual and reflexive understanding,

- Impact: reshape our understanding of urban transitions and urban living labs' local particularities.

These issues have to be considered along the lines of shaping substantial learning and avoiding 'simple texting'. For instance, in urban design and public space matters, drawing on ongoing explorations and findings in the UN-Habitat coordinated Horizon 2020 project Urban Maestro, there is an identified need to better

understand and build capacities for 'design governance' in Europe (and beyond), and particularly 'design exploration' or 'research by design' for how to manage and develop urban public spaces and a sense of place.

LOOKING AHEAD

Can urban living labs become 'the new normal' in co-creating places? We believe so. What it would take is, for instance, to re-organise the systems and business models (commercial as well as academic) that are built around the 'three-year project' timelines. Urban living labs' purposes and benefits would also need to be strategically and clearly communicated and understood in contexts where they are still far from being considered the new normal – keeping in mind, however, that urban living labs are not the answer to everything – the approach is not a silver bullet.

Urban public spaces fulfil important societal functions and shape many of the characteristics of cities and urban areas. Still, there are a number of dilemmas involved in their development and maintenance. Regarding urban public spaces, for instance, typical crossings of concerns are related to everyone's right to the city, climate change actions and how to cater for safety and security without promoting increasingly exclusive spaces (JPI Urban Europe, 2019: 27). Additionally, all these functions, dynamics and characteristics as well as how public spaces are formally and informally organized in general in urban areas determine if a given city is open or closed (Sennett, 2019). Placemakers seem to value the approach, according to a workshop held at the Placemaking Week Europe, Valencia 2019.

Fig. 1: JPI Urban Europe workshop on urban living labs at Placemaking Week Europe, Valencia 2019. Photo: Bylund, 2019.

These urban living labs deal with multifaceted urban issues and are tools to maintain science-policy-society co-creation. Due to their territorial anchoring, they are highly

context specific. As van Steenbergen & Frantzeskaki (2018) show, urban living labs can be instruments to (unintentionally) contribute to placemaking by connecting (social) innovation to urban development. Hence, links between places (as well as non-human living entities) and people are generated, maintained and/or re-shaped, which may foster a sense of place and in turn urban sustainability transformation through these changing spaces (ibid.).

So, what would the development of urban living labs as 'the new normal' mean for the co-creation of urban places, neighbourhoods, and public open spaces? At times when 'innovation' is interpreted as technological quick fixes to the sustainability challenges at hand, something to be put on the market and trickle down to where it is most needed - there is seemingly much to be gained from considering the types of innovations evident when one goes 'back to the future', re-discovering the ways of doing urban life that humanity and planners seem to have forgotten about: trial and error, community-level designs, governance in proximity with the owners of (and experts in) urban public space - the local inhabitants.

The way we see it, 'Urban Living Labs 2.0' has the possibility to legitimise (place-making and public space investments) and decentralize (power and decision making). If urban living labs could truly streamline with urban governance, realize and communicate their full learning potentials and many co-benefits to their environs, then the co-creation of open public spaces would no longer be considered a 'side activity' in urban strategies or a 'tick in the box' for citizen participation in decision making. It would be a self-explanatory and absolutely necessary instrument in sustainable urban development – an instrument which we, at this point in history, simply cannot afford to overlook.

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PART ONE
CO-CREATION AND
PARTICIPATIVE PROCESSES

Understanding co-creation within the public open space development process

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Abstract - *Co-creation as an approach has gained increasing interest from both urban planning scholars and practitioners, since it gives an added value of inclusiveness and stakeholder integration into the planning process. To effectively use the co-creation approach for planning and successful establishment of public open spaces it is important to closely relate and adjust it to the different stages of the spatial development timeline. In the chapter, in-depth understanding of the relationship between co-creation activities and the spatial planning and development process of POS is presented with possible benefits as well as obstacles explained. The focus is on defining the comprehensive structure of interlinks and detailed explanation of supportive co-creation activities with the aim to give the useful background for mutual understanding between urban planning professionals and different stakeholders related to urban open space development for quality of life and environment.*

Keywords - Co-creation, public open space, participatory process, urban planning process, spatial development

INTRODUCTION

This chapter addresses theoretical work conducted within the Project C3Places - using ICT for Co-Creation of inclusive public Places. It explores co-creation as an open space planning and design tool to understand relations among actors as well as to recognise actual characteristics of the process and roles of the players. The work discussed here represents the initial phase of the research addressing theoretical backgrounds and first preliminary findings about key players in co-creation process (experts and participants) and their characteristics in relation to the stages of the process itself.

In the last couple of decades increased public engagement activities (e.g. participation, collaboration, co-creation) have been noticed in the field of urban development. It has been stimulated since 1980ies when a paradigm of communicative or collaborative planning has dominated theoretical discourse (e.g. Allmendinger and Tewdwer-Jons, 2002) and has entranced the field of strategic spatial strategy making by exploring the potentials of at the time new ideas about public argumentation and communicative policy practice developing (e.g. Healey, 1996). This practice shows that variety of activities and actions was understood as participatory also in the context of urban planning, design and well-being (e.g. Atkinson, 2003; Creighton & Creighton, 2008; Jones &Wells, 2007; Sanders & Stappers, 2008) and that there is not enough critical view on that. Fors et al. (2015) in their analytic review of implementation of participation in urban green space development argue that many arguments for participation are taken for granted. They are especially concerned with the direct benefit participation may have in urban green space, pointing that, most of the empirical studies tested process benefits to users and administrators, rather than assessing the physical outputs of participation, and stress further, that because of these process-driven studies it remains unclear whether participation actually improves green spaces (Fors et al., 2015). However, physical participatory activities concerning public open spaces often resulted in a sort of make-up of places or end up as installation performance. Such engagements and results seem far away from what co-creation process is about to deliver. Although for the political happiness such results may often be recognised as co-creation achievement, but from urban planning and urban governance perspective such achievements should be questioned.

In any kind of participatory process, for planners and designers, it is crucial to be informed also from actual effects of different active participation activities on spatial development quality and how outcomes of co-creation processes could improve physical appearance of (changes in) places. Therefore, there is a challenge to explore the entire space development process including entrance and exit points of participatory activities their manner and expected results, to understand why final achievements may still too often diverge or miss provision of conducive places enhancing quality of life. According to reviewed literature by Fors et al. (2015) connections

between legitimacy in government and strong user voices which shall provide a base for better green space administration, which then in turn shell improve the physical quality of green space, were rarely detailed empirically. Thus, the considerable focus on testing human actor benefits could be worrisome, as well as valuation or contribution to physical green (public open) space quality are difficult to grasp.

In such circumstances this chapter reviews and comments on processes of participation and co-creation, and tries to recognise the roles planners, designers, public authorities as well as involved citizens may play that comprehensive results promised by co-creation activities may be as thoroughly achieved as possible. At the same time, from urban planning perspective for public open space development process, it is also examining how to achieve the optimal balance between expertise and participatory parts of this process, discussing when co-creation is the most appropriate and useful to improve outcomes of different process's steps and results. It seeks for optimal concept of co-creation types and interventions. Accordingly, part 2 provides a theoretical framework questioning especially (new) roles of actors in co-creation process, whereas part 3 addresses usage-spatial characteristics as immanent properties of public open places and outlines co-creation model for public open space development process, emphasising concrete experts' and participants' roles and their positions within this process.

THEORETICAL FRAMEWORKS

For successful implementation of the co-creation concept in public open space development processes there is a need to firstly examine background framework(s) of participatory activities related to urban planning. Hedensted Lund (2017) examining co-creation and participation as processes, shows possible linkages between them and points on their roots and therefore potentials they may have for urban planners. Summing up after Hedensted Lund (2017) public participation addresses issues of inequality of rights and power in society. On this basis in urban governance a socially oriented standard emerged. Several initiatives to engage and empower local citizens (Boonstra & Boelens, 2011), as well as concepts addressing and dealing with overcoming of social exclusion (e.g. public-private partnerships and networks for example in urban (re)development processes), provide a space for actual participation. More generally, a so-called concept of social innovation (e.g. Gerometta et al., 2005) emerged as an urban agenda in which social exclusion can be obviate through bottom-up processes. According to Hedensted Lund (2017) such atmosphere was pleasant for emergence of various initiatives, i.e. self-organised civic engagement which is not requiring only rights or power but goes for acting and enabling, and in such circumstances, participation becomes co-creation.

Content-wise evolutionary, co-creation in urban development partly builds on knowledge and experience from processes of innovation in the private sector, partly on the communicative turn in planning theory (e.g. Healey, 1996), and partly on the

social innovation movement and its frames. Accordingly, in private sector, the notion of co-creation draws on methods to involve users in the development of goods or services and the creation of value. In public sectors co-creation as a method or approach often serves as a strategy for addressing complex societal problems, where the focus is most often on resources and the ability to solve problems rather than on inclusiveness, representation and empowerment of citizens. As examined by Hedensted Lund (2017) the studies of co-creation in a public sector context tend to be concerned with generating knowledge about citizens and their experiences with public services to provide a better problem identification for professionals to act on, rather than creating processes through which citizens themselves invent or articulate new services or products of public value and new ideas about which institutional structures may support such activities. Citizens tend to participate as individuals and not as representatives of groups or communities.

As shown, the co-creation concept in urban planning and urban governance is a conglomerate of ideas and norms coming from varied disciplines and practices, i.e. from marketing, public service management, to design and innovation. Perhaps therefore it does not share a very sharped and clear definition, however there are a few characteristics immanent to the process which in any circumstances define it. Such definition addresses decision making rights of people, innovation and value creation via collaborative process involving several types of actors, having a potential for overcoming the limitations of time and geography and allowing a significant leap in the influence of public involvement (e.g. Leading Cities, 2014).

Boonstra & Boelens (2011) argue the ways and moods participatory activities have been conducted since the communicative turn, emphasising especially that processes have been initiated and controlled by public authorities, causing them to be time-consuming, subordinated to political systems working through a decision hierarchy and formalised structures of influence, and affected by an insufficient distribution of authority and responsibility. The problem in such implementation is that more spontaneous citizen initiatives and informal solutions to problems are excluded as these processes enable merely professional citizens or expert citizens to act effectively within the specific framework. Initially in co-creation process citizens are clearly valuable contributors to the process, but the practice showed that their precise role is rather unclear. The questions are how and when they can be involved?

The roles of users/citizens

The literature review shows that when participation is conceptualised as co-creation in urban planning processes, citizens are to be granted an active role. In the last decade, living lab is a popular concept, which again, similarly as co-creation process itself, is not clearly defined. However, there are several characteristics to be matched when implementing living lab either as a method or as a milieu for co-creation. They are as follows: citizen and user involvement, multiple actors' collaboration to

innovate and create a (new) public value based on complementary knowledge, skills and resources implemented in a real-life experimentation etc.

The role citizens can have in co-creation is against the literature (e.g. Voorberg et al., 2014, Fors et al., 2015) mostly recognised in three dimensions: co-implementers, co-designers, co-initiators. Accordingly, the role of co-implementer refers to activities in which citizens are important in making an activity or service work, but do not have a role in the initiation or design of a service or activity. Characteristic of such role is that it does not impose too great demand of user, therefore it is more probable that a wide spectrum of citizens participates. However, it is not clear how such role complements the search for solving complex problems, as it can be very probable, that the problem to be solved, is not clearly defined yet in the stage when such role of user is activated. However, this co-implementer role the most probably reflects a sort of replay on a provided issue rather that active engagement in issue provision. Therefore, it seems the most passive among the roles.

The role of co-designer mostly refers to processes initiated by public actors in which citizens are involved in development of a service or place. In comparison to co-implementer role, the demands of citizen are grater, usually addressing time consumption, competences and collaborative capabilities. In practice this role is often exemplified by living labs. Due to very broad understanding of living labs and/or weak competences for living lab implementation, citizens as co-creators are still often understanding as users of services, which means that information about them and their experiences with public services may be primary focus, therefore they are not necessarily grant a very active role. The role of co-initiator describes the most active and resource-demanding citizen role. According to Hedensted Lund (2017) it draws on social innovation and social entrepreneurship and is illustrated as citizens who are self-organised and take the initiative to address a perceived problem, after which they collaborate with public authorities to do so. Simplified values of these characteristics of the roles a user or citizen can play in co-creation process are shown in Fig. 1.

ROLE / IMPLICATION	DEMAND	POSSIBLE RATE OF PARTICIPATION	ADDITION TO PROBLEM SOLUTION
CO-IMPLEMENTER	Low	High	Low**
CO-DESIGNER	High	Low*	High
CO-INITIATOR	High	High	High***

*   often not considered as quite active as the focus on user's needs or experiences
**   often not focused enough as the problem to be solved is not clearly defined yet
*** because of complex and demanding process there is no guarantees for end user's inclusion or empower

Fig. 1: Characteristics of citizens' roles in co-creation process. Source: Goličnik Marušić, 2018.

These core characteristics of each defined significant role a citizen may play in a participatory process refer to two crucial questions regarding operability of

co-creation as a process: When in a process citizen are active and how active they are? However, for urban planning and development process activities in addition to this it is of key importance in what way the users are involved and how the results of their activities can be used effectively? Therefore, there is a challenge to explore these roles of citizens in a participatory or co-creation processes further and redefine them in the context of public open space development, from the initial reasoning about places to their final physical appearance, usage and maintenance.

The examples on which the mentioned citizens' roles were characterised often come from the field of urban governance where through co-creation processes users are most likely addressed as a source of information about their habits and needs rather than as those who can also actually act, e.g. propose and debate. A comparison of these roles discussed above and summarised in Figure 1 regarding their implementation in the planning-development process shows weak and strong points for each role and calls for their adjustments to spatial planning and development practice.

In this sense the role, when user in involved as the one who react or replay on a given situation or in relation to a simple choice (YES/NO, better/worse), where a demand to participate is not high and therefore likelihood that a wide spectrum of citizens participation is called reacting/declaring. Another role, in which a citizen/user is more active and is usually involved upon some experts' proposals/scenarios are grounded and based on his/her experiences and expectations the user is actively involved in all further steps of the process, from re-defining scenarios, decision-making even in actual involvement in physical implementation of a place design, such engagement is called co-designing. In the situation where the user/citizen is active from the very beginning, for example, coming with an initiative for improvement, new arrangement etc. via all other steps as characteristics for involvement of a so-called co-designer, to the very final step of urban open space provision, usage and maintenance, such role is defined as co-creating. Adjustment of general roles and their characteristics (summarised after literature review and shown in Fig. 1) is illustrated in Fig. 2.
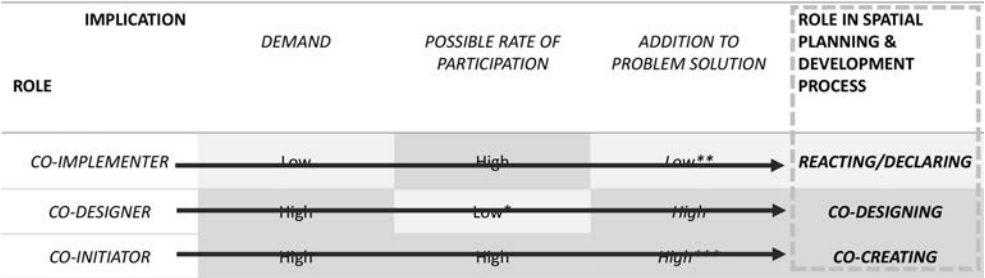
Fig. 2: Citizen's roles in spatial planning and development process.
Source: Goličnik Marušić and Šuklje Erjavec, 2018.

The roles of planners

In co-creation process, especially, where citizens act as co-designers or co-creators is the role of planner in the processes significantly changing, too. It shifts from being the merely an expert making strategies and drawing plans to becoming also facilitator of the processes. The new task is characteristic for an ability to take a leadership for navigation in a process of shard power and voluntary engagement of lay people, who cannot be ordered to collaborate, but convinced of the merits of collaboration. The literature so far recognises three typical roles a planner must getting familiar with to be able to facilitate collaboration: a steward, a mediator, a catalyst.

Accordingly, the steward is a role, which is important in the initial phases of a collaborative process. It is characteristic for establishment and maintenance of the integrity of the process itself. Usually the steward is perceived as neutral, ensuring inclusivity and transparency, and moves the process forward. The mediator is a role, which entrance the floor when actual issues got addressed. The most significant activities reflect on conflict management and arbitering, as the mediator is a person, who nurtures the relations and builds trust among participants. It is however very beneficial being knowledgeable in spatial planning and design professions as, as such, particularly the steward can better direct the process, and the catalyst, skilled in planning and design can focus on seeking out and communicating opportunities for value creation and mobilises participants to pursue these opportunities.

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	POSSITION IN THE PROCESS	PROCESS PHASE CHARACTERISTICS	SKILLED IN UP&UD KNOWLEDGE	ENGAGEMENT	PROVISION	TYPE OF WORK
STEWARD	Early	SEARCH FOR ISSUES	++	Neutral	INTEGRITY OF THE PROCESS	Establishment and maintenance of the process
MEDIATOR	Mid	ISSUES ADDRESSED AND PROCEED	-	Incorporative	NURTURING RELATIONS AND BUILDING TRUST	Conflict management and arbitering
CATALYST	Finall	SOLUTIONS PROVISION AND VALUATIONS	++	Neutral	PURSUIT OPPORTUNITIES AND VALUE CREATION	Seeking out solutions and communicating opportunities

Fig. 3: Characteristics of planners' roles in co-creation process.
Source: Goličnik Marušić and Šuklje Erjavec, 2018.

For planner these roles may be totally new and require a very different set of skills from what has traditionally been called for in planning. The roles of steward and catalyst may be familiar to the traditional planners and designer, whereas a mediator role requires quite new skills. They may also require a change of mindset and professional culture, which may be quite challenging.

As the chapter focuses on the co-creation in the urban open space development process, the core focus is on relationships among experts such as planners, designers

and potential users. The role of public authorities is not examined into greater detail. However, to illustrate a simplified and general frame of this process, one may speculate that perhaps public authority is more of a steward, or even taking the role which assist this position of a steward. In such new situation the role of public authorities may shifts from that regulating state to the one enabling state, with emphasis on providing the opportunities, arenas, and power for civic networks to form and act (e.g. Sirianni, 2009).

In relation to characteristic roles planners/designers can take in co-creation planning/ design processes Zammit and Šuklje Erjavec (2016) firstly stress that the process viewpoint typically relates to other ancillary processes that accompany the design at different stages, including broader planning, community, environmental and socio-cultural processes; and secondly, following Zammit (2013), that in such frame/ context the development management process together with forward planning (policy-making) are crucial interrelated determinants which have a strong bearing on design outcome and quality; and finally highlight that the two-way relationship between the design process and other processes further reinforces the central role of urban designers, taking on a number of different forms. Interestingly, they (Zammit and Šuklje Erjavec, 2016) stress three significant roles, which they see immanently interlinked with the expert knowledge, for urban open space issues, especially grounded in place-making principles addressing spatial quality: enabler/facilitator, advisor to planning policies, and coordinator of diverse planning aspects.

Zammit and Šuklje Erjavec (2016) in the context of co-creation process well enrol the new recognised roles of planners or designers (steward, moderator, catalyst) into expert's work description. According to them they are exemplified as:

- enablers/facilitators dealing with different stakeholders, providing an expert role to inform and empower local communities particularly for bottom-up interventions

- advisors to planning policies, injecting spatial quality considerations into policies and interfacing between spatial planning considerations and the physical interventions 'on the ground'; and

- coordinators of diverse planning aspects, providing a holistic vision for spatial quality and interlinking different development issues and other undertakings into comprehensive urban plans.

Considering these new roles acceptance, they can gradually be exploited for public value creation if planners and other public administrators manage to adjust their traditional roles of being expert and professional by embracing them as expert facilitators of collaborative processes. In such situation comparing to traditional pose they have so far, planners and particularly authorities lose a sort of ordered control over the final product (planned solution) and/or top-down regulated process. The questions are, are authorities and planners already ready to take this shifts in roles?

Can they see themselves also as supporters of the process instead of those being principal? At the same time this represents a big challenge also for planning, landscape and architectural schools. Such co-creative approach brings both, positive as well as negative aspects. It is positive, that diverse types of citizens can get ability and opportunities to be involved in urban development and problem solving. On the other hand, as creation focuses on including relevant and sufficiently diverse knowledge on urban processes to create innovative solutions to complex problems, there is a danger in diminished focus on input legitimacy and power inequalities, putting authorities and planner significantly into a steward and catalyst roles. The research on relevant topics and relations among the actors in the co-creation processes explicitly show that normative content and implications of conceptualising participation as co-creation is needed (e.g. Hedensted Lund, 2017; Fors et al., 2015; van de Ven et al., 2016). And, as shown by Zammit and Šuklje Erjavec (2016) the expert knowledge is still crucial for navigating the entire process, therefore the new recognised roles are to become necessary additional skills of a planner or designer must have as they influence the attitudes planner or designer takes in this process, however they cannot replace the role expert knowledge and experiences from the field.

CO-CREATION ACTIVITIES, SPATIAL PLANNING AND DEVELOPMENT PROCESS

Focusing on co-creation, Fors et al. (2015) studied research addressing user participation in urban green space, pointing to two main phases of the entire planning and development process: making phase – a stage where spaces are planned, designed and constructed; and keeping phase – a stage characteristics for ongoing work of maintenance and rehabilitation of existing spaces, including maintenance operations and systemic policy making. They distinguish also types of user engagement in any of the phases of the entire process: civic engagement characteristics for provision of inputs, involvement in negotiations, fundraising or even lobbying; and physical engagement, characteristics for involvement in actual physical site related actions such as site construction, maintenance of vegetation etc.

According to Fors et al. (2015), civic participation is the most studied. They also point out that particularly low number of articles tested direct benefits to urban green space empirically. These authors argue, that participation to date remains little tested against physical outputs from green spaces and that the empirical work today has primarily focused on benefits to users and administrators rather than physical outputs of participation. They argue further that, administrative and process-oriented aspects of participation overshadow research's potential to critique and understand the physical outcomes of participation in urban green space development. Especially, as they found a great deal of vague rhetoric about wide-ranging benefits of participation without being empirically tested against reality in specific contexts.

In order to improve physical green space quality and considering the essence of co-creation and benefits of urban green space for citizens, user participation activities should be developed and tested against the practical needs of green space development. Accordingly, while it is implicitly agreed that participation is good and capable of improving green spaces, more proof is needed to understand the mechanisms by which participation affects physical green space quality. In this relation, Fors et al. (2015) up-grade Randrup & Parsson (2009) model addressing analytical framework for understanding participation in green space development framing three: dimensions user, administration and public urban green space. The model originally sees interrelations between users and administration and then impact from administration to green space from which then there is benefit for the user. According to Fors et al. (2015), adaptation of the model recognises active roles of users towards the green space and sees direct impacts on green spaces through physical participation and suggests implementation of user involvement place-based approaches for new modes of governance. Such viewpoint corresponds with Šuklje Erjavec and Ruchinskaya (2019), who argue for complex understanding of co-creation of places, which is going beyond merely civic participation, and pointing out also physical participation.

Whereas the urban open spaces are defined by its usage-spatial characteristics, represented by the activities, habits, attitudes and perceptions of people as well as the physical setting, features and elements forming a particular place, the presence or absence of people reflects the character and spirit of a place. As such it influences its usage-based characteristics and attractiveness for occupancy and forms its experimental appearance (e.g. Thwaites and Simkins, 2007). In such context, according to Šuklje Erjavec and Ruchinskaya (2019) the concept of co-creation shall go beyond planning and design activities extending them to the area of implementation, use and management of place. Therefore, co-creation as a process must be based on expert planner/designer knowledge but requiring transparency and efficient supporting tools and methodologies for information and ideas flow among stakeholders, their interaction and mutual development of knowledge and skills.

Structure and interlinks among co-creation activities, planning and implementation phases of urban open space development

As shown above, co-creation as a concept of urban open space development process must take into consideration also aspects of spatial setting and social functioning of space. Process-wise this requires an inclusion of all stages of the spatial development process and addresses all types of related collaborative activities (e.g. civic and physical participation in making as well as keeping stages of space development process). Involving citizens into implementation and management of real places opens dimension of actual doing, e.g. coproducing the physical spatial solutions, being involved in interventions, as well as in sharing values, identities, contents and messages in/about a place.

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To better understand different requirements for expert interventions and opportunities of participant roles in co-creation, the whole process of the public open space development can be structured into 4 categories of engagement: Discover, Debate, Decide and Do, as defined by the Four-D Model for Civic Engagement (Digital Engagement Cookbook, 2017). Šuklje Erjavec and Ruchinskaya (2019) upgrade this concept via wider understanding of possible acts of co-creation and setting up the timeline of the comprehensive spatial development process. By this approach it is possible to present and explain how different types of engagement activities could be effectively incorporated into different stages of the process, and what kind of expert support would be needed. For illustration, within the Discover stage, for example, different types of co-creation activities are possible. Participants could be actively engaged into defining problems and issues, goals and visions by themselves, facilitated either by experts or together with experts in a co-creation process, but also, they can be participating on a more passive way, only reacting to the experts' proposals by opinion making, choosing solutions etc. On the other hand, to set a good background and basis for the public open space development, it is crucial to prepare a suitable set of spatial and social analysis which require different expert knowledge and skills. Although all kinds of local community information and knowledge can represent a valuable empirical knowledge very much related to the community and/or place; and has therefore a great importance for the place planning, design and development process, it should support and not replace the expertise for suitable and successful development of solutions.

The concept is outlined in the schemata (Figure 4). It represents the significant stages of the process from both viewpoints (participant, expert) and merge them in the

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EXPERT e.g. PLANNER/DESIGNER

planning expert's tasks in open space development process	INFORMATION AND DATA GATHERING	PLANNING SCENARIO PLAYING DEFINING PRIORITIES	DECISION MAKING	GUIDANCE PROVISION AND MAP MAKING	IMPLEMENTATION AND REALISATION	MONITORING
additional roles of planner due to co-creation concept	STEWARD	MEDIATOR	MEDIATOR / CATALYST	CATALYST	CATALYST FACILITATOR	CATALYST OBSERVER
development phase characteristics of co-creation process	SEARCH FOR ISSUES	ISSUES ADDRESSED AND PROCEED	SOLUTIONS PROVISION AND VALUATIONS		CO-PRODUCTION	POST OCUPANCY EVALUATION

+

CO-CREATION process results	CO-CREATION CONTEXT, FRAME AND STARTING POINTS	CO-CREATION SOLUTIONS	CO-CREATION CONCRETE PLACE	CO-CREATION MANAGEMENT
CO-CREATION stages	DISCOVER / DEBATE	DECIDE / DO	DO	DO

PARTICIPANT e.g. USER

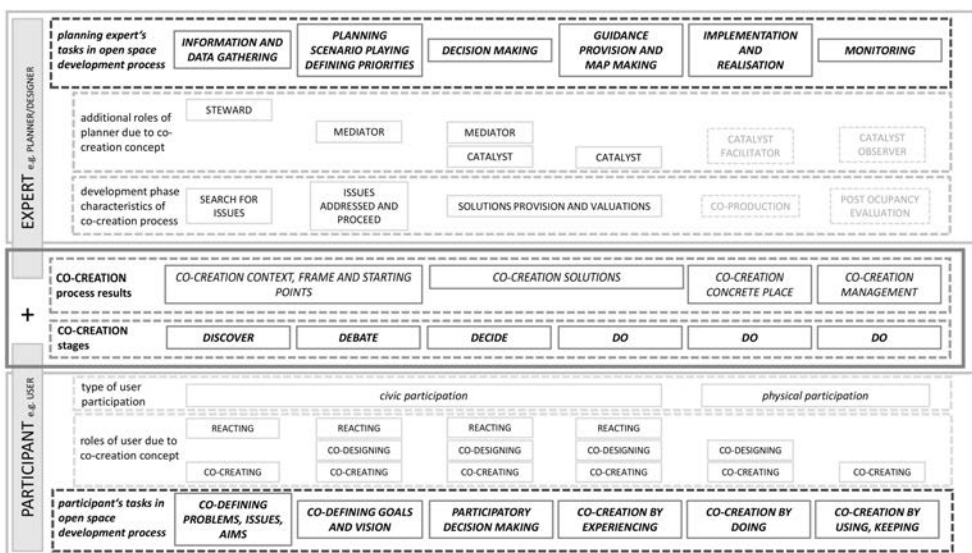| type of user participation	civic participation				physical participation	
roles of user due to co-creation concept	REACTING / CO-DESIGNING / CO-CREATING	REACTING / CO-DESIGNING / CO-CREATING	REACTING / CO-DESIGNING / CO-CREATING	REACTING / CO-DESIGNING	CO-DESIGNING	CO-CREATING
participant's tasks in open space development process	CO-DEFINING PROBLEMS, ISSUES, AIMS	CO-DEFINING GOALS AND VISION	PARTICIPATORY DECISION MAKING	CO-CREATION BY EXPERIENCING	CO-CREATION BY DOING	CO-CREATION BY USING, KEEPING

Fig. 4: Expert's and participant's characteristics vis-à-vis co-creation as open space planning and development process. Source: Goličnik Marušić and Šuklje Erjavec, 2018.

middle line representing co-creation activities and results. The schemata as such do not simulate actual dynamic loops of the process, which remains further challenge to be addressed by the authors in the later stage of the project. It juxtaposes the two key groups of players (experts and participants) and their characteristics in relation to the stages of co-creation process.

CONCLUSION

There is no doubt, that the co-creation of public open space offers an excellent opportunity to actively engage different stakeholders in the process of the continuous everyday urban development. Such approach supports local community interactions that are important for quality of everyday life. Through active co-creation of living and working environment also the positive attitude, care and the sense of place is developed among people, as well as possibility of reducing common problems on spatial and social level of public open space, as for example vandalism, social exclusion and urban alienation.

However, it is very important to appropriately address all the complexities of such multi staged process by well-considered interlinking of different types of engagement activities with adequate expertise support in all phases of spatial development. In this way, positive outcomes of co-creation in public spaces exceed features of the final product, a spatial solution. There are many different types of collaboration activities, varying in intensities of citizen engagement depending on the issue addressed from sharing and interpreting information, co-learning, expressing opinions, defining priorities, refining ideas, making decisions, creating common values, implementing solutions, monitoring, etc. From place development perspective, they are all useful and important, but each with a different potential to fit in and support effectively different stages of the place development as such. Therefore, there is a further challenge in the C3Places project to develop a comprehensive insight and approach to address those issues. In this respect, it is also crucial to accept renewed role of expert(s), whether it is planner, designer or place keeper or manager. Original expert knowledge remains the key driver of the process and still represents the key source of knowledge upon which the new roles the experts shall play become additional skills to the original expert knowledge. Knowledge and content-wise the role is to be up graded but not replaced!

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Assessing digital co-creation in urban transformations: Case of Vilnius

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Abstract - *Public spaces play a vital role in urban democracy since they enable collective usage and reflection. One of the ways to make open public spaces more attractive and inclusive in modern times full of busyness is through the use of innovative digital technologies. Mobile and Internet-based interventions into public spaces deploy a number of strategies – from gathering data through GIS, syntax mapping to using digital tools to collect ideas and opinions of stakeholders. Digitization may often lead to bottom-up initiatives where the citizens and other stakeholders voluntarily employ their talent and resources to enhance the quality of life and solve problems of urbanized societies. This chapter presents methodological Digital Co-Creation Assessment Framework which considers a variety of aspects in the transformation of open spaces to co-creative systems: socio-cultural contexts, multi-stakeholder perspective, diversity in needs, incentives for participation of different groups and cooperation capabilities. The framework provides a useful approach to explore initiatives of digital co-creation as it allows to identify potential areas of improvement and to compare case studies on common indicators. However, definition of complex socio-technical systems, such as digital co-creation, is unavoidably partial, context-specific and temporary. To test the applicability of the evaluation tool, the authors have chosen to analyse the transformation of Aukštamiestis district in Vilnius from a private space to a public place by conducting a case study analysis. The transformational nature of selected case study allowed to identify the limitations of proposed model and define the areas of improvement for applicability in varied contexts.*

Keywords - Co-creation, public places, ICT, urban transformations

INTRODUCTION

Urban innovation is a rapidly growing priority for countries everywhere with an increasingly urbanized world's population. Open spaces can be a source of social capital due to its' political, social and symbolic role in the society (Varna & Tiesdell, 2010). Politically, the public spaces enable plurality and the ability to express the views. The social value occurs because the public spaces enable social interactions between non-homogenous groups of people. Attractive and inclusive public spaces can serve as a balance for negative aspects of urbanized life (Birch, 2016). Lastly, the public places serve as symbols of the larger collective identity by signalling the cultural norms. Martinus (2014) explores the public opens spaces as platforms for strengthening the social capital networks and supporting social innovation systems. The author suggests that "there is an economic and policy imperative to better understand the design, location and user perception aspects of urban space as determinants of user attraction" (Martinus, 2014: 44). Finally, Birch (2016: 123) suggests that "how people access, use, and modify public space often provides an environment in which to study community organization". Hence, the institute of public space enabled to analyse contemporary societal shifts amplified by increased mobility and technology use.
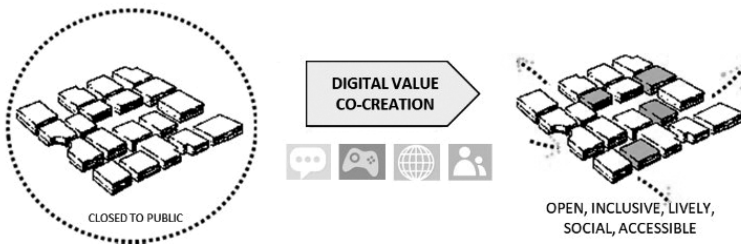
Fig. 1: Transforming public spaces through digital co-creation. Source: Authors.

One of the ways to make open public spaces more attractive and inclusive is the use of innovative digital technologies (Fig. 1). Mobile and internet-technology based interventions tackling the problem of inclusive public spaces deploy a number of strategies and combine a number of different objectives – from gathering data through GIS, syntax mapping to using digital tools to gather ideas and opinions of stakeholders. Digitization often leads to bottom-up initiatives where the citizens and civic organizations voluntarily lend their talent and resources to help the public entities in solving social problems and enhancing the quality of life. Stewart-Weeks (2010: 83) suggests that "citizens are increasingly willing and able to translate their day-to-day experience into ideas, preferences, and insights that can become powerful resources for innovation". Researchers (Polin et al., 2017; Shenk et al., 2016) suggest that the inclusion of citizens, especially those who are underrepresented, into urban planning processes is crucial if the cities seek next-generation solutions and more

connected communities. According to Faga (2006), increased inclusiveness often leads to a stronger sense of ownership in the area.

The co-creative approach is intrinsically user-oriented because it helps the people and organizations to promote their own decisions, develop capacities for open-ended social innovations, rather than invites citizens to participate in existing initiatives (Mačiulienė, 2018). However, the multiple studies on co-creation (Bason, 2015; Bulc, 2012; Brabham, 2009; Franz, 2015; Mulder, 2012), digital tools (Baldersheim & Kersting, 2012; Cheliotis, 2015; Certomà, Dyer, Pocatilu & Rizzi, 2017; Poplin, 2012) and their application in developing public open spaces (POS) as separate subject lack a holistic perspective. In response to the issues discussed herein, following sections demonstrate the relevance of ICT in transforming public spaces by presenting the Digital Co-Creation Assessment Methodology and applying it in studying the transformation of Aukštamiestis in Vilnius City, Lithuania.

DIGITAL CO-CREATION OF PUBLIC SPACES: METHODOLOGICAL ASSESSMENT FRAMEWORK

The advent of ICT-based engagement tools brings with it both opportunities and challenges. On the one hand, technology has the potential to play a key role in engaging stakeholders and extracting key data. On the other, it may encourage new forms of exclusion – many citizens and potential stakeholders of digital tools have limited or no online access, so the tools may further marginalize those already limited in exerting power. It also continues to focus on segments of society which is already high on privilege scale based on education, tech skills, social class and even race (Rumbul, 2016) thus limiting the expected recreation of civic society. The use of any digital application also involves risks related to information security, privacy, and data protection. Some types of platforms gather personal information of citizens (e.g., location, activities, even political views). If multiple data sets are combined, they might reveal sensitive information. Hence, careful screening and regulations are needed. The use of ICT also has an influence on how we perceive public space. On one hand, the researchers (Castells, 2000) propose that the virtual space might replace physical public spaces since the social interactions mostly occur online. Alternatively, urban planners are opening up the planning processes to involve the citizens in designing public places through direct participation, public meetings, negotiations, and other co-creative measures.

No single factor alone causes the change towards more inclusive and engaging public spaces through digital means. Rather a combination of drivers operates at different levels. Hence, a multi-layered framework is needed to assess co-creative initiatives in public places and detect factors leading to positive urban transformations. For this purpose, a multi-layered evaluation framework – Digital Co-Creation Index – has been designed by C3Places research group. The design of the index adopted a pragmatic mixed research method detailed in this section. The first step

was to construct a conceptual framework by capturing theoretical influences through analysis of previous research efforts. This exercise provided a structure for framework dimensions. The findings of previous studies such as Collective Intelligence Potential Index (Skaržauskienė et al., 2015), Quality of Experience framework (Möller & Raake, 2014), Social Networking Adoption Model (Griggs & Wild, 2013) and Dimensions of Space framework (Project for Public Spaces, 2009) were incorporated into further works. Refer to Mačiulienė, Skaržauskienė & Botteldooren (2018) for an in-depth review of relevant literature.

The theoretical frameworks provide an interpretative approach to the social reality and empirical investigations are needed to test their consistency with the reality (Jabareen, 2009). Based on the literature review, we hypothesize that a set of dimensions are influencing the digital co-creation outcomes. However, there may be different configurations and additional preconditions. So, the second step of the process was the expert interviews. The in-depth knowledge provided by the experts on the key evaluation points is particularly suited for broadening the theoretical framework. Nine purposively sampled semi-structured face-to-face expert interviews were conducted to check and improve the theoretical model. The final step towards the completion of the methodological framework was the preparation of assessment methodology – design of updated framework (See Fig. 2), selection of evaluation criteria and proposal of assessment guidelines. The qualitative data collected during the interviews were analysed in the context of respondents' ideas, arguments and opinions in order to deepen the researchers' understanding of the analysed issues. The findings allowed us to explain the processes of digital co-creation in specific context i.e. design and improvement of public spaces.
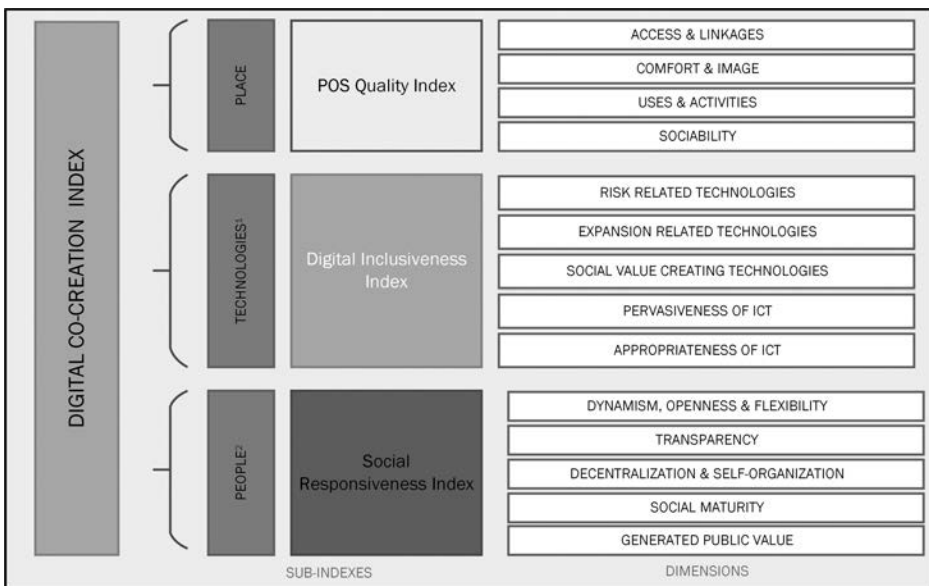
Fig. 2: Digital Co-Creation Index. Source: Mačiulienė, Skaržauskienė & Botteldooren, 2018

The POS Quality dimension connects the factors enhancing the social integration and communities' satisfaction with the public place generated by digital co-creation initiative. The assessment of place quality provides the context of digital initiatives and offers an operational canvas to describe and compare different case studies. In evaluating the access and linkages dimension, the importance of readability, convenience for movement and accessibility is key. Comfort and refers to the level of captivation, comfort, cleanness, and safety in the analysed space. Uses and activities dimension divides into the level of equipment, level of vitality and variety of activities available in the public space. In the analysis of sociability the factors of welcoming, level of publicness, interactivity and diversity influence the co-creative outcomes.

The Digital Inclusiveness of co-creative initiatives can be assessed through five interrelated levers. In evaluating risk-related technologies, the experts stressed the importance of security and privacy assurance tools. Expansion-related technologies refer to the availability of networking and collaboration technologies. The social value of technologies divides into the following evaluation criteria based on the expert insights: availability of data collection and access technologies, knowledge-creation technologies and decision-making technologies. The pervasiveness of ICT tools refers to the ability of the digital tools to easily function when and where needed and appropriateness of tools refers the capabilities of digitals tools in solving the issues put forward by the stakeholder groups related to the public space.

In reflecting on the Social Responsiveness dimension, the interviews led to the identification of eleven evaluation criteria. Dynamism, openness and flexibility dimension divides into criteria of interaction and engagement degree, the supply of critical mass and degree of diversity in the source of ideas. In discussing transparency issues in digital tools, two criteria were established the development of transparent structure and degree of independence. Decentralization and self-organization dimension evaluates by determining its' degree (availability of common norms and shared mental models). The social maturity dimension analyses the issues of social impact on community stakeholders, social motivation and social orientation. In evaluating generated public value two criteria are important– efficiency of problem-solving and new qualities in form of ideas, structured opinions.

The selection of criteria was performed based on possibilities for implementation, feasibility and adaptability of the framework. It must be noted that the subjectivity in the choice of dimensions and criteria is inevitable given the diffuse nature of the concept of co-creation and the lack of more straightforward definitions. However, the goal was to offer a generalized approach to undertaking the evaluation of digital co-creation initiatives. The overall intention was to ensure that the key dimensions of concern are assessed in similar ways. The assessment criteria provide a context for measurable impacts and offer an operational tool to describe and to compare the different public open spaces. The proposed criteria are interdependent and not

mutually exclusive. The framework was not intended to be prescriptive but should offer an organizing framework which can be adapted to the needs of the user. The assessment is a crucial aspect of the implementation of any initiative, as it provides the context for its impacts to be measurable and offers the operational tools to compare the different cases, as well as the same case before and after the strategy implementation.

CASE STUDY CONTEXT AND METHOD

Context of the Aukštamiestis Transformation

Möller (2017) states that in investigation of new and complex topics (e.g. digital co-creation, living labs), it is appropriate to include the context of the examination object in the study. The case study chosen for testing the methodological assessment framework is the Aukštamiestis Living Lab. Living Lab is a place-based concept that utilises the place as a test-bed for innovation and knowledge generation through experiential learning, a combination of concrete experiences, observations, reflections, and the formation and testing of new concepts. Such an approach turns the users into value creators and enables them to explore emerging ideas, innovative concepts, and breakthrough scenarios together with the facilitators (Steen & Bueren, 2017). The selected Living Lab is located in the industrial district of Naujamiestis (New Town) in Vilnius, Lithuania. The Lab was chosen for several reasons, mostly because the transformation of the district is conducted through bottom-up initiatives by creative communities residing in the area. The community implements a wide variety of local experimental projects of a participatory nature – workshops, seminars, festivals, open galleries – with the aim is to develop innovative urban solutions. Hence, it has huge co-creation capacity. Also, the initiators of the Living Lab synthesize the physical and virtual interactions in the space to reach desired outcomes. The Living Lab serves as a platform and a breeding ground for transformative innovations by providing supportive conditions.

The case is unique because it illustrates the transformation of urban space from private to public. The Aukštamiestis Living Lab exemplifies the modern problem of defining the private and public spaces. In the basic sense, the difference between private and open space is defined by its accessibility to outsiders – public space is open to everyone for their use and the private place is open to those permitted by law or custom (Jackson, 1974). However, in reality, this difference is way more complicated – rarely is a space either public or private. The line differentiating private and public spaces is often blurred and spans on a continuum. The Aukštamiestis Living Lab is a great example of such indistinctness. Kohn (2004) defines such spaces as privately owned social spaces and refers to art centres, markets, and shopping malls. Privately owned social spaces combine the elements of both (open/private) and have a set of limits on who can use it and for what reason (Kohn, 2004).

The selection of the case study object imposes several limitations. The lack of publicly available, reliable information complicated the analysis efforts. The main source of knowledge on the Living Lab, it's community and activities, is the digital media. Also, the research on the object is rather limited especially from a perspective of social sciences. However, two workshops for urban planners, architects and stakeholders were organized in 2015 and 2016 in the scope of the Living Lab, which provided new research-based insights.

Method for Case Study Analysis

The goal of the chapter is to explore the applicability of methodological assessment framework in selected case. The research environment (i.e. lacks clearly defined stakeholders, limited amount of documentation) cannot be clearly specified. For this purpose, exploratory case study approach has been adapted. The exploratory case study explores situations with no clear, or single, sets of outcomes. In social research, according to Gallivan (1997), the use of one method can be considered as one-sided and non-inclusive. Hence, the analysis of the transformational processes in Aukštamiestis required the analysis of different sources of information (observation, interviews, questionnaires, documents, artefacts etc.). The study employed three research methods of qualitative nature: Stakeholder Interviews, Digital Monitoring and Document Analysis.

Digital monitoring. First of the empirical methods applied to research the Living Lab was non-formal and non-participatory digital data monitoring. Non-formal observation aims to gain data when there is little knowledge of the situation investigated. In such research, genuineness is an important feature – natural environment and data are collected in real-life situations and adapted to the natural course of events. Digital monitoring required to develop a research instrument – data collection template – based on the assessment framework presented in Section 2. A data collection template makes the web-based monitoring process uniform and allows to discern the patterns between places, people and technologies. The fieldwork was done in the period of May 2018 – August 2018 by the C3Places research group in Vilnius. The website content analysis provided insights on various aspects of website content, features and the presence of web analytic code. The research group monitored the activity of Aukštamiestis community in online social networks and content changes on their websites. In addition, publications on Loftas events and philosophy were collected to get familiar with the context of the study. The data were collected using manual and automated web-scrapping techniques.

Stakeholder interviews. The main method used to conduct stakeholder interviews was a semi-structured interview. Semi-structured interviews permit the researcher to have a list of theme and questions to covered in the interview, but it may have a flexible and fluid-structure depending on the flow of the conversation (Mason, 2002). The interview method enables evaluation of broader context and provides innovative

and flexible ways to interpret the situation. The interviews were conducted in the period of May-August 2018. The data were transcribed and coded.

Considering that the randomized sampling is not suitable for qualitative research (Hennink, Hutter, & Bailey, 2011), expert sampling was employed. In the context of this study, the validity and significance of the results are based more on to the richness of the data collected and the sample selected and the competencies of the researchers to analyse the data than on the size of the sample (Patton, 2002). Five interviews with the stakeholders of Aukštamiestis were conducted, detailed in Table 1. The snowballing method, asking interviewees for suggestions of additional stakeholders, was then used to identify additional contacts.

Code	Expertise, relation to Aukštamiestis Living Lab
P1	Strategic manager at Art Factory Loftas, initiator and manager for Aukštamiestis Lab community
P2	Head of Naujamiestis Seniors club, active participant in Aukštamiestis Living Lab events
P3	Active senior participant in Aukštamiestis Living Lab events, member of club "Life is beautiful"
P4	Architect, participant of the workshops for renewing Aukštamiestis
P5	Urban planner, participant of the workshops for renewing Aukštamiestis

Table 1: Interview participants

Document analysis. In-depth examination of the documents included identifying its overall purpose, parties involved, inclusion goals, mechanisms for achieving those goals, detailed action steps, and evaluation plans of the Living Lab and the district.

The qualitative research methods gain growing importance in contemporary social sciences. Qualitative research process aims to obtain insights on processes and value individuals assign to social situations (Hesse-Biber & Leavy, 2006). In the context of this research project, qualitative research allows to collect and analyse the empirical evidence from different stakeholders' perspectives. The case study approach also has limitations. Mostly because it introduces layers of subjectivity during the implementation, evaluation and presentation of the results. However, the research environment limits the choice of other methodological approach.

DISCUSSION ON CASE STUDY RESULTS

This section details the results of the three research studies. The goal of this empirical research exercise was to evaluate the patterns of content in relation to the conceptual model presented in Section 2. The analysis of collected qualitative content linked the insights of the literature review with the outputs of empirical research – data, categories, context.

POS Quality Aspects in Aukštamiestis Living Lab

The POS Quality Index connects the factors enhancing the social integration

and communities' satisfaction with the public place generated by digital co-creation initiative. According to Puerari et al. (2018:12) the Living Labs "that make use of existing urban buildings and constructions actively shape the place's meaning and the socio-spatial context with the activities that they are running, both at the prominent site and beyond". Hence, the assessment of place quality provides the context of digital initiatives. In evaluating the access and linkages dimension, the importance of readability, convenience for movement and accessibility is key. The analysis of data collected through the use of POS Quality Index revealed the Living Lab is an established organization with a managerial centre – Loftas Art Factory. The space is open and accessible to variety of stakeholder groups (P4). However, it is perceived as a place for youth. Comfort and image refers to the level of captivation, comfort, cleanness and safety in the analysed space. Poplin et al. (2017) suggests that the description of a place cannot be reduced to its objects, but also must contain descriptions of the atmosphere felt at these places. Hence, the background of this territory is an important feature. The centre of Living Lab – Loftas Art Factory – is based in an old radio factory. This historical feature is highly marketed in the communications of the community (P5). Background of this territory is an important topic. This fact was mentioned in the interview with senior participant (P3): "Yes, I have been to Elfa factory and research centre. They made innovative ultrasound engines and other devices. I have pleasant memories about this place, modern production processes and high level popular products". The experience at these places was very important to the participants. Goodchild (2011:1) claims that there is a "fundamental tension with the informal world of human discourse, and nowhere is this more apparent than over the vague concept of place."

Uses and activities dimension divides into level of equipment, level of vitality and variety of activities available in the public space. The community hosts variety of events – festivals, discussions and workshops. The contextual conditions allow the Living Lab to be active in different domains and on various topics (P4). In analysis of sociability the factors of welcoming, level of publicness, interactivity and diversity influence the co-creative outcomes. The Aukštamiestis Living Lab is a setting for community activities, public life, community organization. The Aukštamiestis district is currently undergoing a creative conversion from a private space to a public space. This part of town has extensive industrial heritage and therefore a huge creative potential (P5). Jia (2010) states that the transformations of industrial districts may bring a renaissance in the neighbourhood. The author provides the examples of Ruhr Park, High Line in New York and Art District in Beijing to illustrate this trend. The vision of Aukštamiestis too is a metropolitan industrial district with creative and entertaining solutions.

Limitations identified for the methodological framework. In the context of the Living Lab where the social and urban processes are organized in more abstract manner and on a larger scale, it was hard to determine the spatial dimensions of

evaluation. In addition, the evaluation framework needs a clearer view on what are the necessary and desirable aspects of a functioning co-creation space i.e. providing benchmarking guidelines on how physical spaces could enable real-time participation.

Digital Inclusiveness Aspects in Aukštamiestis Living Lab

We are living in the digital age, a period in which digital technologies serve as the infrastructure of our communications. The influence of information and communication technologies is perceptible in all spheres of life including governance, education, economy, and private lifestyles. The digital tools of co-creative initiatives are crucial in urban transformations. According to Eberlain (2018), first-hand information from the citizens collected through digital means is instrumental in shaping urban spaces because it provides previously unknown data points and creates new awareness and incentives for the community to become engaged. The Digital Inclusiveness of co-creative initiatives in Aukštamiestis Living Lab was assessed through five interrelated levers. Although, the Living Lab activities are implemented via the concept of networked community, the initiative lacks the functionalities of risk-aversion, expansion and social value creation. The digital aspects of the initiative are quite basic at the moment – a system of Facebook profiles is designed to announce various activities of the community.

In evaluating risk-related technologies, the measures of security and privacy assurance have to be discussed. The security of digital data depends on Facebook Privacy Policy. The flow of messages and comments on the Facebook Pages are not controlled or monitored. However, the interview with community leader (P1) that if any security or privacy issues would arise because of their fault – they would fix and apologize. However, they cannot control the flow of communication from website visitors. Expansion-related technologies refer to the availability of networking and collaboration technologies. Strategist of Loftas (P1) explained that expansion to their target groups is achieved through maintaining separate accounts for separate activities of the community. However, more advanced solutions – chats, data collection and evaluation tools, idea collection tools – are not available. The social value of technologies divides into the following evaluation criteria based on the: availability of data collection and access technologies, knowledge-creation technologies and decision-making technologies. The interviews revealed a great interest of initiators of the Living Lab to reach various stakeholders of the district through the means of mass media, social media and events. This need has two roots – commercial and community-building. The first one comes from the need to finance the structural changes in the district, pay for the logistics of the events and administration fees. The livelier is the district, the more people and businesses it attracts. Hence, the community-building, social awareness and partnerships in the area are of key importance. The pervasiveness of ICT tools refers to the ability of the digital tools to easily function when and where needed. The appropriateness of tools refers the

capabilities of digitals tools in solving the issues put forward by the stakeholder groups related to the public space. The data analysis revealed that more pervasive digital strategy is missing. The strategist of Aukštamiestis (P1) explained that Aukštamiestis is an absolute grassroot movement started by enthusiasts, businesses and habitants of the district. So, more advanced platforms and tools are too expensive to be developed due to lack of financial and time resources.

Limitations identified for the methodological framework. The application of the methodological framework in analysis of the case study, showed the need to update the framework to fit the needs of digital initiatives of smaller scale i.e. those who only use social networks for people to join the events or have a website with core information. The tools and platforms enabling co-creative processes bring a number of advantages to the communities, governments and other involved stakeholders. Nevertheless, limited number of projects have limited technical skills needed to develop advanced tools. Besides knowing what different aspects the initiators should consider, it would be useful to add benchmarks allowing to evaluate the performance of current tools and applicability of tools in varying contexts.

Social Responsiveness Aspects in Aukštamiestis Living Lab

The Aukštamiestis Living Lab is developed through projects, initiatives and workshops including community members, architects, urbanists, students, municipality and other interested parties. The involved stakeholder groups and individuals thus become the sources of creativity, insight and initiative in the ever changing district. The initiative mainly relates to three groups of stakeholders: residents and their communities; owners of business and cultural spots; municipality entities. Based on the interview material, they certainly express the need for more inclusion.

Dynamism, openness and flexibility dimension refers to the openness and diversity of the initiative. In co-creative processes, there is a strong need to combine different types of knowledge to better deal with complex issues, exploring visions, possibilities, and finding agreements between stakeholders. The digital initiative is open to all citizens. Due to lack of dissemination, the networked community does not include more isolated societal groups (e.g. seniors). This social disconnection is a key barrier to new collaborative forms of developing urban transformations. In analysing the transparency structures of the Living Lab, their leader (P1) explained that the main way to engage in co-creative activities is to start living and/or working in the area. Community consists of separate house communities and socially active entities can get involved quickly. What unites Aukštamiestis is bigger ideas and purposes e.g. Open Gallery project changes the quality of life to everyone who is located around by adding more colours, traffic and liveability. Because of the increased traffic, the businesses are keen to get involved and even finance different projects. Decentralization and self-organization dimension evaluates the organizational structures of initiatives. The organizational structure of the Living Lab is in place – the initiators

have know-how on event organization and community building. However, they are missing skills and/or drive for inclusion of varied stakeholder groups. Yet only leaders are clear in both online and offline community, neither hierarchy nor funding is guaranteed for Aukštamiestis community.

The social maturity dimension analyses the issues of social impact on community stakeholders, social motivation and social orientation. According to Rohe (2004), the collective actions at the level of district provides a self-reinforcing model of civic engagement and social capital – engagement begets new relations, which leads to greater trust and trust brings effective collective actions resulting in individual and social benefits. The motivation to solve social problem (e.g. exclusion of senior citizens) is quite high – the initiators show high levels of excitement. The initiators suggest that the Living Lab was established out of dissatisfaction with the current living environment. However, there is a lack of skill, personnel and especially time to create a comprehensive and efficient digital communication strategy. In evaluating generated public value two criteria are important – efficiency of problem-solving and new qualities in form of ideas, structured opinions. In the perspective of urbanism, Aukštamiestis Living Lab was inspired by the experiences in other cities and willingness to bring this culture to Vilnius. The start of the initiative was met with pessimism (P1). However, the organizational efforts of the volunteers and habitants led to more cultural events, workshops and new forms of social innovation. The help of municipality was introduced only recently, mainly because of newly elected mayor (P1: It was a huge change in attitude since new mayor. Till then we were even not allowed nearer. Now there is a dialogue. Maybe not so many opportunities yet, but there is a dialogue, we are talking about community projects, proposing tools). The social impact and changed environment of the district became a further stimulus for the initiators and volunteers to develop new projects.

Limitations identified for the methodological framework. The application of the methodological framework in analysis of the case study, showed that social responsiveness dimension lacks a clearer evaluation of the roles of involved stakeholder groups. The analysis of research outputs, especially the material of interviews, showed that the role of pro-active stakeholder groups is crucial in transformation processes. Besides knowing what different types of stakeholders are to be considered in making the places more attractive, the question arises how and when they need to be involved in the co-creative process aimed at long-term social transformations.

CONCLUSIONS AND RECOMMENDATIONS

Digitally enhanced public open spaces are ideal environments for the social innovations to emerge due to the involvement of stakeholders and ICT in the knowledge creation. Although there is broad agreement that ICT application in public governance leads to benefits for society, they should not be seen as an antidote to all problems. The technology is an enabler increasing the diffusion of information and

acts as a fundamental dimension of social change, but technology alone is not capable of fuelling the collaboration. Digital co-creation entails preconditions and challenges due to the diverse backgrounds of actors involved and variety of theoretical viewpoints analysing the processes. Hence, there is an urge to provide holistic approach and investigate the prevalence of the digital initiatives in urban planning. The Digital Co-Creation Assessment Framework focuses on facilitating a framework to evaluate digital co-creation initiatives aimed at improvement of public spaces and identify cases that can be potentially transformed into co-creative systems. Proposed model allows understanding of each of the components of the model and, to add holism to the relationship between them.

However, definition of complex socio-technical systems, such as digital co-creation, is unavoidably partial, context-specific and temporary. The application of the methodology in analysis of Aukštamiestis Living Lab was the first exercise in the iterative revision and testing of the model. The choice of case study method provided an in-depth analysis of a particular setting – transformation of a private space to open place. The exploratory case study of Aukštamiestis Living Lab provided a general understanding for improvement of methodological framework i.e. the need for benchmarking guidelines on how physical spaces could enable real-time participation, evaluation criteria for digital initiatives of smaller scale and how and when different stakeholders need to be involved in the co-creative process. Additional work is needed to formulate measures and indicators of successful initiatives. Digital co-creation encompasses many different interpretations subjected by researchers and disciplines. Various parties are likely to hold different views on the concept. Proposed model offers dynamic ideas for future researches to further conceptualize the underlying perspectives of co-creation. The proposed model needs to be tested in additional cases to further verify its validity and usefulness in diverse settings.

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The production of public open spaces and the deliberate exclusion of undesirables

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Abstract – *While the remaining chapters in this book introduce and discuss a series of experiences in co-creation and participatory processes in the production of public spaces, this chapter intends to reflect on the appropriation and the production of public spaces from another aspect – that of the undesirables, those who are not wanted in the use of public spaces. By 'undesirable' is to be understood all those who, for different reasons, are not supposed to use - at least for a large amount of time - a public space. The reasons for considering someone undesirable are diverse and often not explicit. Yet, this divide severely restricts social development and limits the understanding of publicness and of an urban society, which is undoubtedly becoming more and more diverse. For those considered "proper", such daily actions as using a public space are never questioned. Exclusion is a delicate issue, and thus probably no one will publicly recommend excluding the undesirables from public life; however, in fact, an increasing number of architectural elements are being put in place in order to restrict the accessibility and use of public spaces by certain citizens. And the decision to do so is an ambiguous one, as design aims at finding solutions that are effective from a user's perspective. This chapter argues that the production of public space, namely the idealized informality of open public space, is a continuation of the social conflicts present in normative space dynamics by renewed exclusion means and strategies.*

Keywords - Undesirable and orderly users, exclusion and inclusion, spatial practices, anti-social behaviour

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INTRODUCTION - SOCIAL BEHAVIOUR AND PUBLIC OPEN SPACES

Publicness and inclusiveness sound great in theory, but implementation can be a much more difficult prospect. Urban life brings great challenges, and in order to coordinate them, in a collective sphere, a set of principles and standards that stimulate common sense among individuals has been established. The issues related to the transgression of these normative principles and standards are, in fact, the subject of reflection by researchers from a variety of fields, including philosophy, social sciences, anthropology and psychology (of spaces), and to a different extent they also list those people who have been driven out of public spaces. Among them, deemed as undesirables, are panhandlers, prostitutes, and the homeless, and to a certain extent even the mentally ill, as well as street artists, skateboarders and groups of teenagers. Evicting is *per se* a contradiction to the concept of public spaces as common good, as the main part of the public realm that should be open to and benefit all (Thompson, 2002).

Public spaces are the heart of a city and can not only influence lifestyles, wellbeing and public health but also affect social capital. There is a wide body of research that evidences the benefits of public spaces, from social and educational to environmental and economic. For instance, Smaniotto Costa & Hoyer (2014) and the Project GreenKeys (Smaniotto Costa et al., 2008) analyse the environmental dimensions extensively, while Carmona (2015, 2003) examines the social aspects. Sendi & Goličnik Marušić (2012) highlight the fact that the public space has various functional and symbolic purposes and meanings. Reclaiming public space has been also at the centre of urban debates, especially in the early 1990s, when the death of public spaces was widely pronounced (Bodnar, 2015). Returning to the values of public spaces, the listed benefits are complemented by a good number of conceptual frameworks that, in their intention to guide the production of public spaces, share similar underlying motivations. Despite setting different emphases, they aim at adding value in different ways to the social and environmental urban fabric. In fact, the concept of public space is not one-dimensional, because in public spaces not only different functions and features are articulated, but also the "softer" issues such as identity, belonging and sense of place. In fact, places have become, more and more, a dominant *locus of desire*[1], setting a certain tendency towards the production of locality in the age of globality – to a point where, with increased intensity, a single place is a heterotopia. The *heterotopic*[2] nature of spaces is widely discussed by Patricio, Breser and Ioannidis (2019). Spaces are therefore able to offer simultaneously and cumulatively many services besides their immediate functionality – indeed, as noted by Michel Foucault, "we are in the epoch of simultaneity; we are in the epoch of

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[1] See Lucy Lippard. 1997. The Lure of the Local: Senses of Places in a Multicentered Society. New York: The New Press, p. 4.

[2] Recalling Foucault's "Of Other Spaces", the 1967 conference first published in 1984 in Architecture, Movement, Continuité, no. 5: "The heterotopia has the power to juxtapose in a single real place several places, several emplacements that are in themselves incompatible" (Foucault 1994, 758).

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juxtaposition, the epoch of the near and far, of the side-by-side, of the dispersed" (Foucault, 1994: 752). As Carr et al. (1993) put it, public spaces serve various functions and thus various users. In theory, it is in public spaces that all forms of urban life interact, and share values (Thompson, 2002).

In fact, the nature of this multidimensionality is another factor of complexity, which makes a holistic and comprehensive approach difficult, and therefore not easy to communicate. There are several obvious reasons why communication with the public is important. The production of public spaces cannot be taken for granted, it is in constant fight, not only for the physical space itself, but also for support and funding. Public spaces depend ultimately from taxes; and as resources are becoming increasingly scarce, this fight may intensify (Smaniotto, 2014). The understanding of public spaces, besides their socio-spatial features, has to consider all functions, services, benefits, components and factors as well as their interactions. This all make them common places, the fundament of any urbanity. On top of these interactions are stakeholders and public space users and ultimately the value placed on the places and the environment. This value may play a role in whether someone understands him/herself as part of society or not (Habermas, 1990). Determining who is part of the (urban) society is a complex and almost impossible endeavour that involves risks, such as racism, xenophobia and leaving out some individuals or groups. This is also the scope of *The Struggle for Recognition: the Moral Grammar of Social Conflicts*, by Axel Honneth, noted thinker of the Frankfurt School. In his book, first released in 1992, Honneth develops an interesting approach to the Hegelian intersubjective "struggle for recognition", setting the foundations for a social theory with normative character within the framework of a theory of communicative action. Reinterpreting Hegel in light of the contemporary metaphysical crisis, and thus following the social psychology of G. H. Mead, Honneth notes that the patterns of intersubjective recognition are based on love[3], rights and solidarity (Honneth, 1995: 95), and the negation of these three forms correspond to three experiences of disrespect, namely the violation of the body, the denial of rights and the denigration of ways of life (Honneth, 1995: 131-139). Social conflicts emerge as a consequence of shared experiences of disrespect.

Despite their differences, both Hegel and Mead aspire to the "universalistic achievements of equality and individualism", embedded in a social tissue where all subjects would be recognised as equal, autonomous and individuated persons (Honneth, 1995: 175). This, too, is the idea behind the Habermasian terms of a public deliberation of a "discursive will-formation"[4]. Honneth situates his approach to social conflicts in

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[3] Following the context, we should clarify that "[…] to speak of 'love' as an 'element' of ethical life can only mean that, for every subject, the experience of being loved constitutes a necessary precondition for participation in the public life of a community." (Honneth 1995, 38)

[4] See J. Habermas, 1996, *Between Facts and Norms*, MIT Press, and J. Habermas, 1987, *The Theory of Communicative Action*. Boston: Beacon Press.

the field of morality - *qua* the Kantian aspiration to a universal principle. Only an analysis that seeks to explain social struggles from the dynamics of moral experiences instructs about the logic that follows the emergence of these collective movements. And even if the structure of the social relations of recognition is systematically renewed through time, normative claims are constant and structurally inherent to the relations of mutual recognition. When a group experiences a denial of their rights, social mobilizations emerge.

Public space is still the paradigmatic space for the revelation of intersubjective or social struggles. It is the site of their occurrence and, moreover, the place of social transformation. When it becomes a normative camp by means of architectural elements, excluding the undesirables, social struggles erupt. This is why it makes sense to call for more inclusive urban spaces, shared also by the vulnerable members of the society. Evicting the undesirables raises the issue of who the public is, who those facilities are intended for. It is worth highlighting that the debates on inclusiveness often focus on the reduction of public spaces and their loss through privatisation and/or the increase in control, also through remote video surveillance. The blurring of boundaries between the public and the private realms contributed massively to this form of discussion, as the freedom of movement between both is reduced. The processes of identity formation constitute the basis for Honneth's "Formal Conception of Ethical Life". This means it "[…] encompasses the qualitative conditions for self-realisation (…), insofar as they form general pre-requirements for the personal integrity of subjects […]" (Honneth, 1995: 172). The claim for inclusiveness gives rise to hopes that it would make previously marginalised users and arguments more visible to a broader public. But that is indeed the point. Does engaging those who would usually not participate increase the diversity of opinions as well as the support for co-created solutions? This question concerns the multiple functions of public spaces and their synergic action. Far from reopening classic debates on a just and equitable society, this chapter challenges, not such questions as 'what is a public space?' and 'what are the functions of it?', but overcoming two intertwined challenges: who public spaces are intended for and who is allowed to share and construct them.

PUBLIC SPACES ARE FOR ALL, BUT THEY ARE NOT NEUTRAL

Putting it simply: public space is where social processes and public life take place, and they are inclusive when people from different backgrounds come together. Yet, a public space is only good for a community when people use it. It is our contention that "use" encompasses a conscious and shared practice, where users identify one another. But it is also "use" when users are merely moving around the space.

There is an intrinsic relationship between space and people, as space shapes people's shared values. Whyte (1980) was one of the first authors who empirically studied the

impact of design on appropriation and behaviour in public spaces. He detected that public plazas with a comfortable design, which includes seating opportunities, shelter, grass and trees, were visited by more people than those without these features. He also measured the frequency and interaction of people sharing the same space, and also found that good physical and visible access without barriers was important for the use of public spaces. Whyte (1980) also coined the term undesirables using it for those who are not welcome in public spaces. Although Whyte looked on the undesirables from a more positive perspective, namely stating that their presence in public spaces, too, is a contribution to what makes the sociability of a place. Sociability, anyway, is a complex quality both to achieve and to measure, but it is an unmistakable quality for a place. Gehl (1996) has a very firm opinion: the more quality a place has, the more intensive and diverse are the social activities it fosters. When people see friends, meet peers, greet neighbours and feel comfortable interacting with strangers, they tend to feel a stronger sense of place or attachment to their community (Gehl, 1996: 11). Gehl also highlights that these activities occur only when places invite people. Nevertheless, this capacity to generate quality of place is not exclusive of the actual space. People's relational complexity also shapes the dynamics of public spaces, and it is no less material than their architectural features – from soundscapes to pictorial flows generated therein, to the use of ICT devices, and, perhaps less ambiguously, the conservation or degradation of its furniture elements. This is reflected in a more or less provoked noise or visual pollution. The public use of spaces and its human geographies are of reciprocal moulding: A degraded space is more propitious to instigate criminality whereas a proper space gives a sense of security, for instance. This example also explains how the presence of many healthy people in public spaces generates barriers against violence and crime.

The relationship between people and spaces is of such deep strategic importance that in 2015 UN-Habitat published a set of principles for improving access to good public spaces and to demonstrate the value of public involvement in securing, developing and managing public spaces (Charter of Public Space and the UN-Habitat Global Public Space Toolkit, 2015). The Charter and the Toolkit demonstrate how public spaces are crucial for democracy and community well-being. Public spaces are the ideal stage for showing publicness and for actions that need public attention, such as demonstrations, strikes, sport events, or even carnivals, which require precisely the prominence that public spaces can offer. These events require the immediacy of a live acting or the impact of the kinetic energy of a mass in motion (Šuklje & Smaniotto, 2015). This evidences that public spaces have to be understood as a sphere of defiance and debate. Malone (2002) refers to them as a place of political struggle and protest, and in this sense, they are a place of participation, democracy and inclusion. But, on the other hand, if certain groups, because of characteristics as diverse as socioeconomic background or age, are excluded from their use, the question necessarily arises: can these spaces still be called public?

In this context, Strohmayer (2016) employs the term 'public' to comprehend aspects of spaces that invite, rather than discourage, participation in the shaping and reshaping of society. This means that, through the use of public spaces, place design can transform communities. This evidences the close relationship between space and behaviour, which in turn builds a sense of belonging and place attachment. Public spaces are therefore an intersecting mirror to reflect local culture(s). Public spaces as mentioned above are only good for people if people use them. And that is a question of determining qualities, namely attractiveness, accessibility and design (which also encompass maintenance) on the one hand; and a question of being attracted by and making use of the same qualities, on the other. In other words, the mere existence of a public space does not ensure that a community benefits from it. A public space can only spread its wings and find its place in the core of the community if it responds to what people need. And that differs, not only from population to population, but also between age or socioeconomic groups. This calls for a responsive public space that congregates different publics and is dynamically adaptable to different milieus. However, potentially speaking, by offering opportunities to gather and reflect, places acquire a meaning for people, and this meaning, associated to their appropriation, turns spaces into places. These qualities are therefore capable of establishing an emotional appropriation of space. The sense of belonging and the sense of attachment are diverse and become even more multifaceted when associated to other dimensions such as communities' values, norms, beliefs, ethnicity, and symbolic meanings (Iecovich, 2014).

If there are undesirables, this also means, of course, there are desirables, also called the healthy (Carmona, 2015), on the flip side. The healthy are those who speak on behalf of a large number of voices, for whom public spaces are made. With them all the pros and cons are identified, they also provide a broader perspective; one that favours sharing knowledge and expertise among stakeholders (Carmona, 2015). The articulation of such a normatively important "public" in placemaking is a key, even if implicit, of the planning endeavour, which results in the symbolic placing of sites. In reality, however, such collective practices are often hampered by an underlying notion of the public as a unified field of practice, a singular articulation of civil society.

The participation of all (desirable) stakeholders, thus involving a wide range of interests, is at the heart of novel forms of placemaking. Such actions legitimize a broader liberal model of construction and a coalition of interest groups. In the field of participatory science and consulting, placemaking has been supported by the concept of 'partnered governance'. This advocates promoting the inclusion of a wide range of stakeholders, particularly end-users, in a variety of tasks encompassed by placemaking and producing public spaces. If this will result in more inclusive and sensitive public spaces remains to be seen, but that is the basic idea of co-creation and partnered governance.

Eventually, this also communicates how policy makers and placemakers are experimenting with novel approaches and structures to transform the public realm. All is well and good, but what are the results when design is used to segregate people and prevent them from enjoying space?

THE UNDESIRABLES AND THE REGULATED ACCESS TO PUBLIC SPACES

Castells (1996: 410) aptly points out that "Space is the expression of society". If so, does the concept of equity have any relevance to the production of public spaces? To see places and their multiple meanings as a matter of political, as well as planning, social and cultural importance is not new, but is something that emerges cyclically when the liveability of the urban environment is in question. Backed by the previously discussed arguments, it is true to say that space encodes power, in the sense of who may use the public space, just as who may be involved in placemaking, which ultimately aims at creating better places. There are at least the above-mentioned quality factors that can contribute to the effective appropriation of spaces across barriers.

Public spaces are being challenged in a time of instability with pressures on society through political changes, economic instability, migration, refugees, etc. Climate change alone will mean more flows of refugees and more conflicts over natural resources. These immediate uncertainties, however, reflect the diverse ethnic, economic and cultural makeup of the urban society. A pluralistic urban society also needs "the plurality of public space", as Carr et al. (1992) state. The authors also highlight the fact, that one single public space does not serve all, but various groups; and that spaces differ in terms of physical shape, character, or the envisaged purpose or manner of use. If so, does this corroborate the assumption that there is "room" for all kinds of people in sharing spaces, even for the so-called undesirables? This is a tricky question, since equity implies there is strategic thinking behind it and an investment in following this strategy. Perhaps one of the reasons why equity and placemaking, no matter how well intended, often fail to lead significant societal and behavioural changes is that there is no recognition if there are no incentives for immediate personal gains. Hence, equity implies investment, and the quality of public spaces is not to be achieved without efforts. The use of spatial resources, and public spaces are a type of land use, to fund long term liveability is for nothing if cities do not manage to effectively reduce exclusion and division.

The difficulties increase the more the *public*, the target of placemaking, differs from decision-makers and from the above-mentioned normative principles and standards in culture, socioeconomic status, age, education and value systems. Low et al. (2005) state that currently cities are facing a different kind of threat to urban parks,[5] not only

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[5] Noting that urban parks are the most classic typology of public spaces; with the predominance of unsealed soil and greenery, they provide not only socio-cultural benefits but essential ecosystem services.

one of disuse (and to this we add overuse and misuse), but also one of patterns of design and management that exclude some people and reduce social and cultural diversity. The literature supports this view, and, as far as this reflection is concerned, it advocates that a wide range of people are prevented from benefitting from public spaces. In this regard we need to point out that most of the problems that culminate in undesirability (especially social exclusion) cannot be solved by urban design. They are a social issue, but one that becomes more visible and pressing with a growing number of marginalised people (undesirables) in the streets and parks. The situation is more alarming when these undesirables become an eyesore and are accused of "stealing the city" from the "orderly people" (Belina, 2003). Moreover, public perception conjures up undesirables' images of delinquency, loitering, etc.

Another aspect refers to the interaction between how planners "plan" the spaces and how people use and give life to them. Divergences in this relation, i.e. graffiti or loitering, are often identified as problems. Ensuring that such relational issues, between 'the city as it is designed and made by professionals' and 'the city as it is experienced and filled in by its residents', are taken into account at the earliest possible stage can help reduce problems. Therefore, it will be worth shedding light into the relation of public spaces between how they are planned by professionals and how they are experienced and enlivened by people. No doubt a greater diversity of people and lifestyles has implications for the sense of a place, and probably for its use, design and management. Appropriation of public spaces will not be homogeneous and permanent. The question is if such frugal interconnections between different dimensions will inspire and steer future policies.

In the C3Places' Lisbon case study, teenagers are the focus group. Often, young people belong to the group of undesirables, although teenagers are among public space's most frequent users. The presence of teenagers is often associated with anti-social behaviour, for instance as a result of noise made by skateboarding or playing music loudly. The case study will also serve the purpose of demonstrating the value of involving teenagers in placemaking, trying to direct their voice to policy recommendations. Co-creation as advocated by the Project can provide guidance.

The issues pertaining to teenagers' use of public space are diverse, complex and in many cases tied to particular local conditions, particular ages of young people, and specific situational problems (Batista et al., 2017). The public space provides them with the context where they can gather and interact away from adult power and supervision, exploring the freedom to be themselves. Conversely, despite this spatial need and the opportunity offered by public spaces, teenagers are, in different contexts, deprived of them and prevented from enjoying them. They can be excluded in multiple ways, as they are often viewed as a "polluting" presence (Wyn & White, 1997). Their behaviour in appropriating space is often loud and of a confrontational nature, disrupting the subtle rules of public behaviour and the delicate boundaries

that delimitate space use and configuration. This puts them on the front line of conflict over space (Malone, 2002). Conversely, young people have complained that adults interfere in their affairs without reason, and that authority figures treat them unfairly, especially in instances where they have not broken any laws or committed a crime.

Adolescents are excluded, not only from a free experience and use of space, but also from the process of placemaking, as adults are often entitled to act upon young people without their agreement. For this reason, the case study in Lisbon focused on the direct engagement in living labs of teenagers. The case study provided empirical evidence that when teenagers have the chance, they are able to discuss their needs and develop new opportunities for an overall improved experience of public spaces.

Even so, the future of placemaking needs to integrate an intergenerational mix and people from diverse cultures. Methods and means to protect all vulnerable members of the population need to be put in place to secure equity in the allocation and design of these spaces.

HOSTILE ARCHITECTURE AS ANSWER TO THE UNDESIRABLES

Public spaces are a right, not a privilege; people rely on them for daily activities (Francis, 2016). As discussed above, they are the places where social life occurs. To practice societal verification and protect the "orderly" from undesirables, different cities are denying some citizens basic rights of access, use, and enjoyment of public spaces. There is no doubt that the recognition of the benefits of public spaces for the liveability and competitiveness of cities is growing. Investment in public spaces has grown in recent decades in many cities. This evidences that quality public spaces found their "place" in policies and urban agendas. However, this widespread recognition raises the question whether the design of new spaces embraces cohesion and equity too, besides a function of embellishment.

Design features based on people's needs are important for the success of public spaces. To be vibrant and alive with people places need to be inviting; among the amenities are benches, greenery (trees, flowers, etc.), ease of transit use (walking, biking), and lighting to support comfort. Moreover, the call for more sustainability demands to incorporate nature back into the city, and public spaces are for many inhabitants the only place they have to connect with nature. On the flip side, the call for safety and surveillance challenges also designers, and this latter call is used to attempt to discourage undesirables from using public spaces and to avoid anti-social behaviour. The results are design answers, also called defensive design or hostile architecture, that put the use of public spaces in question. Hostile architecture is concerned with actions to make public space hostile and uninviting, and with adopting measures to deliberately exclude the unwanted. Figure 1 depicts some simple but

Fig. 1. Just a walk through the city, as here in Algés, in the Lisbon metropolitan area, reveals different hostile and uninviting measures to keep strollers away. Photos: Patrício, 2020.

effective examples. The act of making public spaces hostile, as discussed above, is of a cosmetic nature, and does not get to the root of the social problems that provoked it. Furthermore, Jock (2019) argues that what hostile architecture achieves after all is to make life even harder for those already struggling. This kind of design guidance can also unintentionally affect other *orderly* but vulnerable groups, such as the elderly and children, which cannot be the aim of any public policy.

Maybe the most visible act of hostility is the lack of investment in seating solutions. Whyte (1980) sets opportunities for seating and staying as one of the qualities that help draw users into the space and make public spaces more sociable. Benches are particularly important for older adults' social integration in their environment, as they create the opportunity to sit comfortably to observe and connect with others. Seating facilities also have a positive impact on the liveliness of commercial streets. Hostile architecture not only involves the lack of seating accommodation but also includes setting benches in rows and not in clusters. This does not encourage, for example, teenagers to have group conversations or homeless people to linger in public places. Anti-sit-lie devices are just as normative to people as traffic barriers are to the vehicular circulation they prevent.

Examples of lack of comfortable seating in newly developed public spaces include the waterfront development in Lisbon (Portugal) and the reuse of a parking area in Hannover (Germany). In Lisbon, the Ribeira das Naus-promenade (Fig. 2) is a favourite spot to appreciate the sunset along the River Tagus. But people search in vain for comfortable seating. Sure, the terraced riverbank can be used for seating, but the steps do not offer an adjusted ergonomic solution to the requirements of the elderly, for example. In Hannover, the abandonment of a parking area in the city centre gave birth to a new open space. The area, called Marstall (the former royal

Fig. 2: The Ribeira das Naus-promenade in Lisbon, since 2014 a terraced inclined plane made of yellowish sandstone, provides access to the Tagus and has become a new magnet for strollers – albeit without sitting facilities. Photo: Smaniotto 2015

stables), situated in the red-light district of Hannover, was completely redesigned between 2017-2018, as Fig 3 shows. The contemporary design is interesting as it sets flowerbeds as a measure against drug selling in the shadow of the parking lot. Drug dealing is used to justify the absolute absence of benches, not even around the new water games in the new square. In this part of the Marstall, maybe the new restaurant with its outdoor area played a role in the decision. Firstly, because the owners do not want competition from public benches, and secondly, they surely do not want people lingering for extended periods. However, after a public outcry, a bench was installed in the square. This wooden park bench doesn't match the design language of the place, with its striking appearance and modern materials. In a press release, the Council stated that seating opportunities where planned from the beginning.

Further examples worth noting briefly are directed against skateboarders. In Lyon (France), in the Jardin du Musée des Confluences, with an area of 24,000m² located at the confluence of the rivers Rhone and Saone, concrete blocks offer seating to admire a unique view of the rivers and of southern Lyon. But "pig's ears" deter unwanted skateboarding by eliminating the long smooth edge of the blocks that skaters seek (Fig. 4). In Lisbon, a new park was created in 2005 in an abandoned tramway workshop and became a honeypot in a neighbourhood with few open spaces. From dusk until late at night a meter high wall that separates the park from the street became a popular meeting-place for students and young people.

Fig.3: In Hannover a former car park transformed into square provides an attractive open space
in a difficult area, but people cannot stay long as no benches were planned for the area.
Photo: Smaniotto 2019

Fig. 4: Pig's ears deter unwanted skateboarding on concrete blocks
in the Jardin du Musée des Confluences, Lyon (France). Photo: Smaniotto, 2018.

Following a complaint lodged by the people living nearby, in 2016 the City Council installed a triangular metallic structure to prevent people from sitting on this wall (Fig. 5). In both cases, the municipalities considered more the prevention of users' undesirable behaviour rather than facilitate the park appropriation.

Fig. 5: The metal triangle over the wall in the Jardim Arco do Cego, installed to prevent people from sitting on the wall and therefore from hanging out here. Photo: Patrício, 2020.

Another issue which is underpinned by the same principle is reported by Carmona et al. (2003). The authors mention an extreme example of a direct action aimed at keeping undesirable people away from public spaces. They reported the use of the electronic device Mosquito in the UK to keep teenagers away from particular places, as it emits irritating, high-pitched radio waves in a frequency to which teenagers are more sensitive than adults. These devices are used in parking lots or in front of shops to maintain teenagers (unknowingly) at a distance.

The present global security crisis, with the spread of terrorism acts, is giving rise to new threats on the public use of spaces. Anti-terror infrastructures aimed at preventing acts of terrorism also affect "orderly" users and partly prevent them from using a space. The changes around the Eiffel Tower in Paris are an unfortunate example, as evidenced by Fig. 6 evidences. Until few years ago, people could walk freely underneath the tower. The area is now walled, even of glasses, they prevent people from enjoying a pleasant view and just cross the Champs de Mars park.

These examples expose a central question that we face with undesirables and the publicness relocated. This evidences a narrow line between enabling, protecting and limiting the use of public spaces. The results of eviction processes are usually homogenization and domestication of places, or even to what Sorkin (1994) called the disneyfication of public space. More than the social and physical damage the hostile actions cause, is the fear of new events that can drive all these security actions and their extension. Changes in the urban public landscape will consequently

follow. The examples also show that design and architecture are powerful instruments, their success in terms of sociability depends on how they are used. They can create great places, where people feel safe and welcomed, or uninhabitable places that are not inviting, in a way that they cannot be an improvement towards a better quality of life.

CONCLUDING REMARKS

Public spaces have always been a contested domain. Following the processes of social divide, which has created a split between legitimate and illegitimate groups of users, and between appropriate and inappropriate use of space, the answers of professionals through hostile architecture have perpetuated spatial segregation and fostered conflicts over public goods, while not providing sustainable solutions. Members of marginalised or vulnerable groups, like the homeless or teenagers, are frequently the targets of hostile architecture devices. Consequently, if we want to provide an adequate account of the actual production of public space, we will have to tackle both the political landscape that frames the nature of its social conflicts and the publicness of the open spaces that produce or mitigate social clashes.

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Public Spaces, spaces of public domain: Icons of a contemporary simulacrum?

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Abstract - *The contemporary city is a result of plural connections between the historical matrix and the effects of global policies. Immersed in a flux of multiple contents, it seems to respond to an era of transition in which the sense of belonging to an urban space is profoundly tensioned by transformations in the cultural, social, technological and political dimensions of public space. On the one hand, contemporary urban territorialities bring new possibilities to issues related to urban morphology and fabric that are still mainly culturally determined; on the other, contemporary thinking confronts itself with the tendency of a global scenario where public life and contemporary culture are related to consumption and capital circulation. Although relations of belonging and attachment to the urban space may persist, the flow of global conditions seems to have an impact upon collective experience in the urban territory and in the production of public space. These are transformations that may lead not only to the instrumentalization of space but also to the reduction of its 'public' value. In the contemporary city we observe particular processes of functional and economic spatializations of the urban where public spaces are not conceived as spaces of a public realm. Noting that the intersection between past/present time-cultural flows should go beyond the (re)production of any new global paradigm of thematic urban configurations, we argue that the theoretical constructs of the contemporary public space, or spaces of public domain, must be representative not of a thematic 'everywhere-nowhere' urban environment, but rather of a public life urbanity, one built upon awareness and around political and civic issues.*

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Keywords - In-between space, contemporary city, spaces of public domain, technology

INTRODUCTION

This chapter intends to foster the understanding of the contemporary city and to question processes and transformations of public open spaces (hereon just public spaces). Both, the city and the public space seem to respond to an era of transition in which the sense of belonging to the urban space is profoundly tensioned by transformations in the political, social, economic, cultural, technological and environmental dimensions. The feeling of belonging to an urban space, conditioned by the flow of local and global conditions, persists and may have an impact not only upon collective experiences and personal attachment but also on the reconfiguration of contemporary public spaces.

Critical approaches to today's urban public spaces question the "urban", its interpretations and forms of appropriations (space and territory/spatialities and territorialities). We may argue that transversalities and tangencies to the contemporary public space promote urban practices beyond its 'regular' limits, combining itself into new hybrid patterns[1]. Still, in a context of increasingly flexible and multi-layered public spaces, what kind of publicness can be produced/recognized? What collective practices and discourses are being (re)produced as mechanisms for the signification of contemporary public spaces? What is the impact of technological transformations in the public space? Recent social and technological transformations reinforce the instrumentalization of public spaces and the reduction of their 'public' value. Consequently, it is not uncommon to observe a public space that, due to the loss of symbolic value, is no longer the physical counterpart of a civil society understood as a subject of the city. A public space where the disruption of its boundaries and power arrangements point to the dissolution of meanings that affect the collective public experience; where we observe the impoverishment of social representations and the retraction of collective forms of life - for Augé, established "blind spots" (Augé, 1994), spatial conditions that promote, in relation to the city, citizens' alienation.

WHAT ABOUT? (I)

In a context where liminalities, tensions and boundaries become blurred, and new tangencies may define new 'places', the relationship between constructed public spaces (or spaces of public domain[2]) – permanent or temporary, formal or informal - is vital for the possibility of new urban fabrics and conceptual constructions.

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[1] Hybrid patterns, hybridization processes as a matter to be thought not only by means of their production but also in terms of their assimilation and continuous development in the debate of the public (and spatial) spheres of the urban environment.

[2] Nowadays the classical notion of public and private space is obsolete and does not answer the complexity and publicness arrangements of the contemporary urban space appropriately. There are forms of contemporary physical public spaces that, in fact, may not even be so public. For instance, private spaces that may act like public spaces: spaces of public domain that act as public spaces (like shopping centers or 'pops', privately owned public spaces). Although the distinction between public spaces and spaces of public domain will not be developed in this chapter, it is necessary to understand that otherness and diversity, in a public rather than an artificial way, are essential constitutive elements to public spaces.

We argue that we should focus on the (re)signification of new multi-referential "in-between" spaces of public domain, diverse and hybrid due to their public condition. "In-between", between two clear or accepted stages or states, having the qualities of two things, therefore difficult to describe or know exactly. "In-between" public spaces that break boundaries, deal with porosities, intermingle dimensions and conceptions demand studies that interrogates contemporary spatialities and territorialities. "In-between" public spaces that are not just the setting for occasional programmed collective political actions that conform the urban space, but rather for otherness.

The contemporary city, in its new forms of cultural enunciation, considering urban fabrics and territorialities, bring about new questions to the urban environment, thus also promoting new contiguous and ambiguous symbolic interpretations, demanding investigation of the cultural spatiality of the public realm of the urban space (Alves, 2006). It is a matter of observing not only emerging urban forms and their culturally implemented referential universes, but also intermingled relations between public space and public sphere, urban place and public spatiality, urban space and culture image, urbanalization[3] and city consumption. Challenging the tensions between domains, legalities and socio-spatial practices related to the public space and spaces of public domain - beyond the models and concepts instituted in Architecture, Urbanism and Social Sciences -, this questioning may open up new possible interpretations of the relations between urban morphologies and cultural constructions.

In the complex pathways of contemporary culture, the topology of place construction is determined by a new socio-technical multi-referential scenario of multiple utopias, of a mediatic society in which culture is associated to consumption. Its practices are associated more to a mediation of capital circulation than to the social milieu. In this context, the public scope of the contemporary urban space must deal with a particular new social-technical capital market determined by a hegemonic global economic model, as well as by the impact of information technology upon societies.

New forms of cultural expression and social communication open unexplored fields of investigation and practice regarding urban spatial structures. Yet, at the same time, they threaten public life and the idea of city ignoring the urban space as a social product, representative of historical values and endowed with local symbolic culture. In this scenario, the analysis of concrete spatial situations related to a public space of multiple dimensions demands the observation of questions related to its context and product, such as: the strategic absorption of the textuality of the localism; the cultural, functional and economic specialization of urban processes; new morphological patterns that may lead to segregated urban environments; or thematic urban landscapes that deal with the urban space as a commodity. Besides

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[3] The urbanalization, concept proposed by Francesc Muñoz based on Pardo's notion of banal, which reveals a simplification of the city by means of a process of standardization of the urban space, mostly based on the homogenization of its singularities, in which urban diversity is submitted to a common global order. (Muñoz, 2008)

all these questions, another one remains: the essence of public spaces as *locus* of conflict, diversity, otherness and the possibility of resistance as its essential element.

In a context where more and more spatial patterns of urban fabrics are submitted to a global homogeneous process, contemporary thinking confronts itself with the totalizing tendency of capital upon culture. In the textualities of the multiple dimensions of today's city, a city whose paradigms have been destabilized by undetermined and diffuse territorialities, the classical conception of public space and the ways to conceive the distinction between public and private territories must be reframed. It is in this framework that the manipulation of heterogeneous and complex elements, be they unique or not (urban typologies, 'new' urban planning rules or theoretical constructions), should be considered in the analysis of urban models in order to avoid the prevalence of processes representative of territorialization and de-territorialization phenomena (in relation to their spaces, sceneries and actors), products of the relationship between culture, capital and global economy.

As a matter of fact, the manipulation of social, cultural, political and technological transformations, also by means of image combination and re-composition, validate a particular urban model, one that simulates urban environments that disregard most of their physical or social references – to a certain extent, an example of Sorkin´s 'ageographical cities' (Sorkin, 1997). This is also a model that promotes cities that do not necessarily represent singular social worlds, but that answer a pre-established imagery. In the city of discursive stratifications or in the city of another genealogical ´topos´ - where, in both cases, concepts, forms and spaces mark events -, it is necessary to focus on the socio-cultural dimensions of the emerging contemporary ways of urbanity – socio-spatial practices that correlate their public dimensions to their transformation processes and permanencies, their structure elements and their strength lines.

WHAT ABOUT? (II)

In this scenario, to what extent do the so-called innovative landscapes of the global age appropriately respond to new forms of enunciation of the spatiality of the contemporary public space? To what extent is the spatiality of new urban fabrics submitted to a homogeneous cultural and economic context that may promote the logic of social and spatial segregation of privatized spaces?

Any attempt to deal with the notion of public space today must understand the dichotomy between a plurality of social practices and several faces of the transformation of the notion of the city, encompassing both a unifying global meaning and the appreciation of differences in meaning. The notion of the city as a public good, a place of conviviality and conflict – conflict in the sense of diversity and debate, of otherness –, is nowadays being questioned by another idea of urbanity. One that does not take into consideration that conflict is part of the essence, one of the basic

elements, of public space, of the constitution or destitution dimensions of its public spheres, of the public and private dimensions that constitute the classic grammar of the urban life.

In a shuffled grammar based on a strategy of social control and reproduction of an established order, where the sense of history has been mostly reduced to an appearance imitation/simulation game, we experience a different sense of urbanity: from the modern form and function to a post-modern fictional spectacle. This grammar answers mainly to sectors of the market, fashionable formalisms, aesthetical experimentations and media codes instead of to the complex articulation of daily urban life, often transferring civic activities to spaces of private domain or promoting new spatialities of global pre-determined imagery.

We observe the transformation of the public urban landscape into a product, an object of new tastes for consumption, legitimizing a new sense of urbanity that, under the impact of neo liberal policies and global models of urban interventions, promote the deflation of the public urban sphere (Alves, 2014). In the contemporary urban spectacle, the public space, attached to the system of production and consumption of goods, is related to the production of a space-landscape of saturated images - for instance, Vrijthof Square in Maastricht (see Fig. 1). In it, the goods, in seductive image forms, become the constitutive principle both of the organization and of the relations of social practices. In the superabundance of the 'post-city' we face, on the one hand, the city as a spectacle, not just a mere display, the place and the way of receiving the aesthetical social relationships of contemporary culture; on the other, the aesthetization and spectacularization phenomena become powerful mechanisms of symbolic control of the production of the urban landscape and its spatiality. As a consequence, it also becomes an urbanity in many cases related to the transformation of the private/ public relation and the promotion of a particular spatiality of social segregation.

Fig. 1: Maastricht, 2018. Scenes of public space: a thematic object of consumption?
Photos by the author.

If it is true that cities and public spaces are composed of urban structures determined by conflicts of different natures, objects and actors, it is also true that the stage and dimensions of these constitutive elements have been transformed in the last few decades – for social, economic, political and technological reasons. Conflict and consensus are two fundamental aspects (some will say configurations) of the distinct conceptions of public space and public sphere. They govern the classical elements of urban life, presenting today an intermingled grammar in which the real and virtual dimensions are jumbled in a blurred zone that jeopardizes the independent existence of any of these constitutive spheres of public spaces. Consensuses are articulated in a kind of artificial form, more or less fabricated, but not less efficient, one that frames urban conceptions, images, interventions and proposals in a multiple--scale public space.

Therefore, what we observe is no longer an ordinary public space transformation, but, in fact, a highly sophisticated urban model that continuously interchanges brand and commodity, commodity and space. In this context, the experience of the visual, in many ways supported by technology, consolidates itself as a mediating element between the landscape and the geography, between the city and the territory, between the individual and the public space, becoming central to the reproduction of the urban space. In the global age scenario, 'avant-garde' public spaces are mostly related to a banal type of consumption environment, where practices, knowledge and identity are submitted to a homogeneous cultural and economic context. To a certain extent, these so-called 'avant-garde' public spaces do not necessarily articulate with each other or with the urban landscape, mostly promoting an urban fabric of social and spatial thematic cities within the real city. This is an environment that reduces the sense of context and the relations of everyday life with the appearance - immaterial condition -, where the urban public space loses its social meaning allowing for a de-territorialized urban form. These cities are not cultural artefacts to be experienced, but rather, as a result of consumerism and commercialization, fake objects of space-consumption of an aesthetic empty form.

WHAT ABOUT? (III)

As a matter of fact, an emergent city operates in a differentiated social-cultural context. This city, on the one hand, encompasses an intrinsic relation with the urban culture and with an imagery submitted to significant processes of social and technological transformations, and, on the other, requires the revision of concepts and action plans regarding its spatiality (both physical and social). In this contemporary city the urban space is evidenced in many ways, either mapping out and questioning the emergence and transformation of new conflictive processes (around the classic axis of the structuration and appropriation of the public space) or in contemporary forms that can or cannot dislocate and/or substitute old demands.

In the contemporary urban space, heterogeneity, which is intrinsic and necessary, is at the same time fostered and crushed by the overlapping of a collage of social

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assemblages and urban forms (of coexistence), only possible in a society of mass production where a kind of 'inflation' of products and information reigns. In our contemporary society[4] spatialities create new proximities and explicit distinct material, political, economic and ethnic landscapes, according to a container logic: traditional typological elements, as streets, squares, public and institutional spaces -, are transformed into *containers*-objects, thematically reduced to a set of the urban functions of a controlled space[5], a space of idleness, consensus and consumption characterized by models and similar standards of intervention in the production of an urban environment, particularly public spaces, to be visited intensively in part time (Muñoz, 2008). This is an urban space that produces a-territorial landscapes characterized by the economic and functional specialization of the territory - in every place, landscapes of nowhere, related not only to the materiality of space, but also to its permanency, ephemerality and de-territorialization (temporal substractum).

In fact, the contemporary public space materializes itself in a polarized city that loses identity and meaning, becoming more and more difficult to be noticed as public object. These are cities where urban networks and / or urban structures are not conceived as a public realm that results from the overlap of historical times and social, cultural, economic and political processes. What we see are the so called 'place-specifics' of homogeneous urban landscapes which offer lifestyle choices and amenities that promote "new" standards of behaviour and social appropriation of urban public spaces. If that is so, to what extent can we say that public and private spatialities, appropriations of places, formal references of identities and sociospatial practices are still to be inquired and interpreted as a phenomenology of diversity, a diversity which, while recognizing influences, reveals differences, that allows for otherness.

ALMOST FINAL OBSERVATIONS (I)

Public spaces are nowadays mostly scenographic spaces of visual consumerism, fragments of urban displays reduced to the surface of urban appearances composed by isolated pictures, mostly vectors of privatized fortresses ruled by control, exclusion and claustrophilia. Public spaces that set aside the urban space, creating a fictional city ruled by the interiorization of functions of the 'old city' - a city built by simulacra of public spaces that disregards the importance of the place. A city where identity disputes and appropriations of the past are no longer the counterpoint between the constructed and/or official memory and other versions of the social memory.

In this 'ageographic' city of huge containers, of gentrifications brought about by the homogeneous urban renewal proposals of private capital, we observe – independently

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[4] Augè characterizes the contemporary society as the society of super modernity, defined by the factual and spatial superabundance and the individualization of the references (Augè, 1994).

[5] Containers, accordingly, to Solà-Morales' definition, are understood as elements of capital accumulation and reproduction: economic, cultural, touristic or social capital (Muñoz, 2008).

of the technological impact - public spaces of temporary occupation and anonymous confluence, flexible space-time contexts designed for the client, not for the citizen. Failing to consider this aspect will lead to further human alienation in a time of estrangement from the world, an alienation based on the individual experience of dislocation and detachment, one where a common pattern of public space easily transforms the urban space into an empty form. When it loses its social meaning, when displacement takes place, the public space loses its sense of belonging.

Although the urban space is both a product and the producer of the dynamics that governs its time, the experience of urban life and the relation of belonging to the urban space differ in the midst of a set of transformations that affect several dimensions – from the right to appropriate urban space to the appropriation of hybrid spaces (according to the understanding presented above in this chapter). Our shuffled reality transforms any act concerning the public space and the contemporary city into an extensive series of successes and failures that peacefully coexist along with conceptual and operational intentions to govern complexity, if not for any other reason because hybridization processes blur the boundaries between legal and illegal, formal and informal, modern and contemporary, citizens and foreigners, homeless and no-right population to a point where it is almost impossible to determine the dimensions of grey areas, to distinguish subjects and stakeholders, nature and culture, centres and peripheries, media-dimensions and native cultures, public and private spaces - publicized or privatized. As an enigma, the contemporary emphasis has accelerated displacements of the representation of things in the world and promotes a recurrent flow of instabilities. In contemporary times, the territories of representations replicate themselves in contingency accidents, contaminated and hybrid, relative and syncretic. In contemporary times, things change - instantaneously, in immediate terms - without necessarily operating a synthesis of thought (theoretical) or realization (practice) of some outcome.

ALMOST FINAL OBSERVATIONS (II)

It is in this context that the urban space, a space of representation of human relations, chaotic traces of confluence of pluralities of cultures and ways of life, remains the result of singular forms of the relationship between man and his physical space that govern and participate in events. In a world in which the contemporary built environment is representative of a new universal paradigm, an 'everywhere-nowhere' model of production of the contemporary urban space[6]; in which spatial

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[6] A model that, as a result of a pre-established imagery, looks for legitimacy on the superimposition of a global and modern matrix over the archaic and uneven city. According to Boyer (1996), the urban representational model of the contemporary city envisages the city as a spectacle that corresponds to the global capital in constant flux. The image of the city of the spectacle, without territorial and physical specificities, represents an urbanity and urbanization processes more and more privatized. We observe today urban interventions representative of gentrification processes, which generate social expelling and exclusion and reduce the complexity and heterogeneity of the urban environment to an aseptic vernacular landscape of civility. The city of the spectacle is the transformed city, as much as possible, in goods; a city where the cultural capital has an important role in the definition of its physical and social transformations.

conformations and socio-spatial phenomena, conditioned by the dynamics of advanced financial capital, structure and promote, in the use and appropriation of space, the dissolution of stable relations with the physical and cultural geography of space itself; where the aspects of entrepreneurship of the city emerge with special resonance, it is important to (re)-learn to capture social urban forms.

Operating in a different sociocultural context, the intersection between past/ present time-cultural flows should go far beyond the (re)production of a new global paradigm of thematic urban configurations in the production of a city that responds to an era of transition (as mentioned above); a city of unprecedented forms of enunciation, of a contemporaneity conformed by economic globalization and the planetarization of processes that conform daily life; a city where micro-geographies of a public space of new uses and appropriations are determined, at least to a certain extent, more by the needs of a highly commodified world than by human needs in time and space.

In this context, what are the conditions that conform public space? Are we living in a condition of simulacrum of public spaces as part of the social construction of urban form? The public space has been transformed in the contemporaneity, not only accounting for the fact that new technological conditions of communication and mobility are increasingly permeating space through physical deployment (Internet of Things devices, for example) but also that urban transformations are characterized by a dilemma of complex uncertainty. Whatever the level of uncertainty, it is funda-mental to recognize the change from the key "city-work-politics" to another one, according to a new diagram of an entrepreneurial nature: "city-management-business".

Crary (2014), in his book '24/7 – Late Capitalism and the Ends of Sleep" argues that productive processes and labour relations were completely restructured in a new logic of flexibility. What was conventionally called 24/7 - 24 hours for seven days a week - was made possible by processes of a new global infrastructure for work and consumption – for instance, an automatic self-service Pizza Place (see Fig. 2). The expression 24/7, beyond the notion of frivolity, disallows any overlapping of meanings of rhythm and periodicity, presupposes an arbitrary and inflexible system of a weeklong operation, seemingly emptied of relations and the unfolding of the cumulative experiences of human life.

A 24/7 environment appears to be a social world of flexibility, speed and efficiency, but in reality, it is a machine-operated model, an antisocial suspension of life that does not reveal the human cost that underpins its effectiveness and its functioning. In the restless acceleration of a time that does not remain the same, we observe, simultaneously, a demand for change and a search for the anonymous, a demand for updating and a search for identification.

Under these conditions, the 24/7 time, marked by indifference, is the reminder of a pre-modernity that has not been completely overcome. The ambition of models

Fig. 2: Tours, 2018. 24/7 Self-service automatic Pizza Place. Photo by the author

such as these refers to a new set of panoptic practices, creating control conditions according to full visibility. One of the most widespread clichés in the technological discussion, as Crary (2014) puts it, is the occurrence of a historical shift in a very short interval of time when technologies have superseded a whole set of older cultural forms. However, understanding global contemporaneity as a new technological age results in the apparent conclusion that the context hitherto developed would be unavoidable, attributing large-scale economic changes to small phenomena of everyday life. In this sense, the illusion that there is a unified and lasting link between the many constituent elements of contemporary experience is perpetuated, in such a way that we would move towards an apparent level of technological and intellectual competence never seen before. The production of urban space is linked to such transformations.

FINAL OBSERVATIONS

"When the exclusions governing the constitution of political public space are naturalized and contests erased by declaring particular forms of space inherently, eternally, or self-evident public, public space is appropriated" (Deutsche, 1997: 122). We live in an era of digital transformations, for good or for bad. Beginning after the Second World War, the mainstream narrative has claimed that digital technologies would enhance positive transformations related to, among others, global knowledge, transparency, inclusion

and quality of life. More recently, a critique has been provided of this evaluation pondering questions of control, surveillance, loss of privacy as well as of belonging. Ironically, people start to fear what is different, what is unequal, and find themselves more and more inmates of their own social ghettos.

Our current reality is determined by a situation of incremental technological changes that question the possibility of urban stability in a global hyper-mediatic society of the post-industrial era. It is in this mumbo-jumbo that the production of contemporary public spaces occurs, one where the loss of reality in urban life is the other side of the coin in a city that is unable to show anything but an image (devoid of stimulus and knowledge), and vice-versa.

Public spaces are places where collective or individual rights should be affirmed, exercised or confronted socially. Public space depends on social tolerance, diversity, conflict, that is to say, on the availability of the coexistence of diversity, of the differentiated. Public spaces are established through concrete forms and actions, anarchic, despotic or democratic, utilitarian or philanthropic, temporal or permanent, through physical forms that demand the understanding of the meaning and nature of their physical configuration. Confrontation does not reduce, but actually affirms relationships and interactions. In our times, "in-between" spaces of manifestation of public life, space-time structures that make possible the realization of relational life, propose a critical reflection on the meaning of between, otherness, mediation, certainty in the public space, a place between places. However, the contemporary public space, configured by barriers and limits, seems to be prepared for consensus, not for otherness. Therefore, in these contemporary times, how may the meaning and performance of publicness differ in distinct "in-between" city patterns of public spaces?

As Deutsche (1997) claims, public space is fundamentally a political space, a democratic space whose protagonist is an abstract entity that we call citizen. It is necessary to put an emphasis on open and iterative processes of co-creating public spaces. "In-between" ambiguous spaces of invention, producers of knowledge, hackers of new spatialities that may offer new connections with the city and today's culture.

Any investigation into the configuration of these "in-between" relationships of contemporary spatialities must observe narratives of multiple natures to better understand public space scenarios of a heterotopic society where: we observe a dislocation from the model of industrial city to diffuse and undetermined spatial patterns; the phenomena of demographic explosion and customs implosion entail new patterns of urban morphology and force us to (re)think the city in light of today's multifaceted reality; there is not only the chronological or linear sequencing, replacing the synchronic space-time of the mnemonic landscape; we observe a non-serial asynchronous time of "pass-see-pass" that mirrors the images of sporadic appearances and forms a landscape of "pass-time" images. In this scenario, cultural,

social, political and economic issues, as well the impact of information technology, are important elements to be considered. To be considered, not necessarily to be accepted, thus making it possible to avoid the development of a techno-aesthetic view of alienation from the context.

Public places must be based on social plurality (not a fake one), considering not only permanencies but also the local identity, instead of thematic urban landscapes; social cohesion and dynamic urbanity, instead of global 'urbanilization' processes of functional and economic spatialization. New territorialities of public domains substantiated and built up on the collective memory of a multi-referential social plurality are central to enabling multireferential public spaces and their distinct representations, in opposition to the obscurity and devaluation of a simulacrum of a collective memory of frozen fragments, valued by the consensus of a thematic official history – as we increasingly see in an urban context of pre-defined imagery. We believe that this is a possible way to long for a city of public spaces that are not transformed into cultural technocratic spaces and consumer-oriented products of a supposedly global technological "avant-garde" of mere commercial (re)production.

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Exploring co-creation as a learning process to (re)think public space from a transformative perspective

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Abstract - *This chapter explores the potential of co-creation for the planning of public open spaces that could be more attentive to different, unequal and diverse social ideas, needs and desires. Co-creation is discussed as an innovative opportunity for learning and (re)thinking urban planning. Exploring ideas, literature and experiences (from the European Project C3Places), the chapter discusses the role of co-creation for involving citizens in placemaking. This reflection addresses co-creation as a collective, contextual and engaged process of learning. From this perspective, co-creation is discussed as an open process of learning about predictable ideas in the relationship between socio-spatial imaginary, requirements, needs and urban design procedures from a transformative perspective.*

Keywords - Sharing knowledge, open creative opportunity, adaptive process, learning process

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INITIAL REMARKS

The importance that co-creation assumes in urban design, planning and governance is correlated with a growing and influential presence of the digital in the wide range of themes associated with urban and social innovation. More than an ideal of citizens' participation or a passive form of commitment (Voorberg et al.; 2015; Erjavec, 2017), co-creation emerges as citizenship in action in placemaking and governance. Hence, citizens are considered co-designers and co-producers, among other possible nuances of the modus operandi with which people are engaged in placemaking. This contributes to endorse the goal of a "networked city"[1] (Bolier, 2016), whose hybrid meaning can also be associated with the idea of "net localities" (Foth, 2017), or give rise to a *cyberpark*[2]. The city emerges as a wider and more complex "platform" than just the fields of communication, sensors (Bollier, 2016) and public administration. However, in the context of placemaking, what can co-creation address?

The term co-creation as a simple substitute for participatory processes may raise doubts. It might even represent itself as another saviour concept, as if it were an (more) effective substitute for everything that has already been developed and experienced about citizen participation and involvement. Voorberg et al. (2015), reflecting on co-creation in the public administration sector, establish the connection between the concept of co-creation and the term of social innovation. For the authors, both terms appear as magical solutions, without actually having a reasoned basis. In the matter of social innovation, they point out that its poor conceptualiza-tion probably comes from its widespread use in policy-oriented literature. Therefore, they conceptualise social innovation as a reference to the creation of a long-term response to social needs, especially: "(…) changing the relationships, positions and rules between the involved stakeholders, through an open process of participation, exchange and collaboration with relevant stakeholders, including end-users, thereby crossing organizational boundaries and jurisdictions" (Voorberg et al., 2015: 1334).

Co-creation is thus an inherent condition to the purpose of social innovation, arising from the reference to participation and end-users. Nevertheless, emerging from the private sector, in the business world linked to the development of brands, products and services, the term co-creation comes forth as an opportunity to boost business. Thus, in the private sector, end-users are co-producers of goods or services, seen as those who add value to a given product or service, as well as to a given company, influencing the customer/consumer (Prahalad & Ramaswamy, 2004). In this context, co-creation relates to "the active involvement of end-users in various

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[1] A "networked city" ideal would involve, among other things: the openness, iteration and experimentation, an emphasis on users and commitment, social equity and inclusiveness (as suggested by Stefaan Verhulst; in Bollier, 2016: 41)

[2] The CyberParks Project (http://cyberparks-project.eu) advocates that the hybrid space is a new type of public space. The insertion of ICTs in physical spaces, however, has to be planned by municipalities with citizens, and not be implemented by private companies and tech suppliers.

stages of the production process" (Voorberg et al., 2015: 1335). However, as also pointed out by Voorberg et al. (2015), in the public sector end-users are citizens.

The purpose of this chapter is therefore to discuss the role of co-creation through citizen involvement in placemaking, starting from ideas, literature and experiences (Project C3Places), by proposing co-creation as an open learning and adaptive process inherent to the placemaking process.

CO-CREATION, END-USERS AND CITIZENS: WHAT ARE THE IMPLICATIONS?

From a systematic literature review of the terms of co-creation and co-production, Voorberg et al. (2015) point out aspects that need to be recovered in order to better understand the relationship between citizens' involvement in innovation and co-creation in the public sector. Therefore, in the scope of co-creation and/or co-production, citizens are considered key partners in "developing and re-designing public services" (idem: 1347). However, the authors observe a frequent interchange in the use of the terms of co-production and co-creation, without empirically having a clarification that distinguishes them. Nevertheless, given the relationship between public participation, collaborative governance and community involvement, co-creating and co-producing refer to active citizen involvement, as opposed to the passivity with which the idea of participation is associated. The authors warn that greater clarity can come if, in the framework of social innovation, co-creation is differentiated in terms of the degree of citizen involvement (idem: 1347). This contributes to highlight three types of citizen involvement: (i) co-implementer ("involvement in services which refer to the transfer of implementing activities in favour of citizens that have been carried out by government"); (ii) co-designer ("involvement regarding the content and process of service delivery"; (iii) co-initiator ("citizens who take up the initiative to formulate specific services" (Voorberg et al., 2015: 1347).

For Voorberg et al. (2015), co-creation in the public sector refers to citizens engagement as co-initiators or co-designers. As concerns citizen involvement in the co-implementation of public services, the term co-production would be more appropriate. Nevertheless, while co-creation is considered very important in the literature consulted by the authors, the term is practically "a value itself". That is, there are objectives to raise citizen engagement through increased efficiency and effectiveness in order to create more satisfaction. However, the authors do not identify one objective that makes it possible to explain why it is important to co-create and/or co-produce. The analysed texts refer more easily to factors that may influence citizens in co-creation, rather than the results of a co-creation / co-production process. Indeed, the difficulty in detecting a result or product directly resulting from co-creation is transversal to all systematic-critical reflection developed by Voorberg et al. (2015).

Returning to the influencing factors, the authors distinguish two sets of factors: those of organisational scope and those linked to the citizens. As for the former, it is understood that they refer to the "compatibility of public organisations to citizen participation". This can be exemplified by the existence of appropriate infrastructure or facilities for communication and training of civil servants and citizens. However, the authors note that administrators and/or politicy-makers do not always act towards citizen involvement, as it can be uncontrollable ("the administrative environment is not aimed at incorporating citizens in public service delivery" (Voorberg et al., 2015: 1347). In terms of factors related to citizens, essentially, they would be associated with citizens' interest in participating, their awareness of the ability and possibility to influence the public sector, and the social capital needed for the development of a sustainable relationship between public sector and citizens. The weak influence of these factors – both on the organisational side and on the citizens' side – is usually associated with "something that the public organization must do" (ibidem: 1348). Voorberg et al. (2015) also highlight that, regarding the results of co-creation / co-production, two aspects must be retained: (i) the report of specific results would make it possible to ascertain whether the effectiveness of "public service is being enhanced"; (ii) the scant number of studies on specific outcomes confirm that co-creation / co-production is more commonly assumed as a value in itself, "which does not need to be legitimized by referring to external objectives" (ibid: 1348).

From a more operative perspective, in a more recent text, Voorberg et al. (2017: 178) take up the idea of co-creation "as involvement of citizens in the initiation and/or the design of public services to develop beneficial outcomes". Here, citizens are key partners in co-creation initiatives as they have "specific resources and competences which are valuable for (re)designing public service delivery". Through that, transformed into co-creators, citizens are much more than consumers of public services.

After consulting the term co-creation in IGI Global, Erjavec (2017: 103) highlights the multitude of ways to explore it while pointing to the affinity of the term for business, marketing and digital technologies. Nonetheless, Erjavec (2017) observes a differentiating aspect about the act of co-creation, which refers to the *act of creativity*. Thus, co-creation differs from terms such as collaboration and cooperation, although all are taken as actions associated with working, doing, deciding or defining something together. This, in other words, allows us to consider the term co-creation as the possibility of conceiving something new. Citing the Leading Cities report and IGI Global, Erjavec (2017) points out that co-creation differs from public participation, as co-creation techniques allow us to go beyond temporal and spatial boundaries, enabling proactivity and public involvement, with the increment of the decision process. This, on the other hand, would provide new opportunities for self-governance, because it not only involves the community, but also key drivers (stakeholders) in the decision-making process. From the author's point of view, co-creation

allows us to go a little further than citizen participation, which is considered to be more focused on collaboration between public and decision-makers, and even among influencers (here considered as opinion-makers).

In short, co-creation can be taken as a collective process of value generation. A process in which, starting from the citizens' experience, an innovative interaction is established, and the result reflected in a mutual and continuous process of value creation and, as such, learning and adaptation. This is, then, a generative thinking process that calls for a "creative initiative on the part of the entire team", from researchers, technicians, clients, designers, and the people who will benefit from the co-creative experience[3] (Sanders & Stappers, 2018: 9).

CO-CREATION, ICT, CITIZENS AND PUBLIC SPACE: WHAT ARE THE IMPLICATIONS?

Public participation in urban planning is an essential factor for the success of inter-ventions. Since the public space is understood as collective good, ideally its use would result from a collective desire to have citizen's needs addressed, accessing resources and properly performing activities. However, authorities and technicians created mechanisms that have affected citizen participation in the context of the production of public spaces. In line with the view that the process was very time-consuming and complex, public participation often became a mere public consultation process. This means through a superior decision that is more or less endorsed and thus understood as shared, allowing, as Jacinto (2001: 82) states "to legitimize decisions that are described as representing the expectations of the communities". Participation and legitimation of decisions are often intertwined, along with a conviction that people do not understand most issues raised and, at the same time, are not able to propose technical solutions.

Tackling more directly the placemaking and governance issues, namely from the viewpoint of human-computer interaction, Foth (2017) states that the user of urban space must be rethought on five levels: as resident, as consumer of services, as participant in community consultations, as co-creator in a collaborative approach to placemaking and, finally, from a socio-ecological transitional perspective, "as part of a much larger and more complex ecosystem of more-than-human worlds and of cohabitation – a process that decentres the human in the design of collaborative cities". To Foth (2017: 22) the evolution of the user in his/her relationship with the city and urban governance occurs from the following relations:

- Cities 1.0: City Government / Administrator – Citizens / Residents;
- Cities 2.0: City Government / Service Provider – Citizens / Consumers;
- Cities 3.0: City Government / Facilitator – Citizens / Participants;
- Cities 4.0: City Government / Collaborator – Citizens / Co-Creators.

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[3] Sanders & Stappers (2018) discuss co-design, considering its purpose to be more directly aimed at the development of design solutions.

Furthermore, Foth (2017) argues that none of the levels of a user's relations is correct or more important than the others; and that "place makers and urban interaction designers" should even take a transdisciplinary and dynamic perspective of these different levels of public space users. However, this perspective does not exclude the conventional approaches to spaces' use and usability, habitually more related to citizens/residents. In this sense, Foth (2017) refers to studies of ethnographic and sociological nature, even when concerned with the relationship between people, space and digital technologies. According to this author, it is critical that "urban interaction designers" consider: (i) creating "interventions that explored new terrain at the intersection of the physical and digital city"; and (ii) conceiving one "spatial turn" in order to capture digital reality as part of physical reality, that would define a hybrid space (Foth, 2017: 24)[4]. Regarding consumers, the author refers the interest of urban designers to adopt a more sensitive understanding of the relationship with the customer[5] and the user. This sensitive understanding of the consumer and client relationship aims to capture the subtle differences "between the ways a client conceives of their user base and the picture emerging from user research the designer conducts"[6] (Foth, 2017: 24).

It is interesting to note that Voorberg et al. (2017: 179) refer to the influence of co-creation on the change of "conventional ideas about who is responsible for public service delivery and how decisions are made about the allocation of public resources". In a co-creative dynamic, citizens are different from each other, and play or may play different roles in the course of the process, which contributes to creating different relationships and behaviours. On the one hand, this suggests an interest in learning how to deal with conflicts in the co-creation process. On the other, this brings the benefit of accepting the co-creative process as a mediation context – a process that Foth (2017: 30) calls "middle-out". Co-creation is to be understood therefore as a means to mediate interests, needs, knowledge and proposals in order to generate collective benefits. This understanding may also mean overtaking the bipolar meaning of top/down and bottom/up logics. Alternative paths, such as through co-creative perspectives, contribute to the construction of the socio-ecological transition, as requested by Foth (2017). With this objective, it will be interesting to expand and combine socio-spatial experiences, mainly with respect to the relationship between people, their symbolic-cultural ways of interpreting the world, their living spaces and relationship with the territory (Menezes, 2018).

Co-creation can also be conceived as a "weak utopia" (Cruz, 2016) in the face of the new configuration of urban economy. As Cruz (2016: 48) observes, the distributive economy admits of a "distributed creativity", where big actions are replaced by small

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[4] About hybrid space, see also: Smaniotto Costa et al. (2017).

[5] The customer is not necessarily only the citizen, but often he/she is the public administration.

[6] For Foth (2017: 24) the challenge for urban designers is "to master a balancing act that requires the artful integration of knowledge and insights about people at different levels of granularity".

and multiple acts. To the author, this shared vision could be a stimulus to think about social innovation, where the driving axis would be co-design. In a shared vision, both of networks and of less rigid systems, digital technologies can play an important mediating role. However, as discussed by Sennet (2018), it is important to address two fundamental assumptions to understand the role that ICT can play in the framework of a smart city. First, the smart city as a prescriptive postulation implies a closed, appeased, authoritarian city which does not accept frictions and conflicts, diminishing the cognitive capacity of people who fail to reflect and grasp their surroundings, conceived as the territory. Regarding the second assumption, smart city introduces the idea of coordination; the coordinated smart city is open, and technology helps in terms of its coordination. The coordinated smart city gives more control to citizens and provides feedback to them. The coordinated city also enables negotiation, choice and options, being more democratic, inclusive and fair – from a human, social, spatial and environmental point of view. However, it is a perspective that entails efforts and an experience whose "implementation will require a new ethos and (…) a new literacy" (Cruz, 2016: 48).

LEARNING IN CO-CREATION AND SOCIAL LIVING LABS

A context of excellence for the pursuit of co-creative purposes involves implementing social living labs. According to Nesti (2018: 313), the term "living lab" is first referred to at the beginning of the 1990s in an article describing students' experience in a problem-solving process in a neighbourhood in Philadelphia. The term was further developed in 1995 by William J. Mitchel (from MIT - Media Lab and School of Architecture) to test and build up new methodologies that could enable the approach to complex social problems. As a result, living labs have gained popularity in the framework of creating new business innovation models. In 2006, the term was officially taken over by the European Union.[7]

For Nesti (2018), there are three features that define living labs: (i) they are built on the basis of a collaborative organisational approach involving public authorities, companies, research organisations, and people; (ii) they use co-creative and co-design methodologies to seek solutions to social problems, explore uses and emerging behaviours, as well as prototypes in real contexts, and assess the impact caused; (iii) they are presented as an open concept for innovation, considered to be possible from "a continuous process of exchange of knowledge between actors and learning-by-doing" (Nesti, 2018: 314).

Learning to work in the open sense which the co-creative process, in principle, presents in the framework of the also much-needed innovation in urban planning, is fundamental for a transformative transition of urban spaces. Conceiving co-creation

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[7] "(…) when the Finnish Presidency launched the European Network of Living Labs (ENOLL) and the European Commission began financing the creation of LLs under the 7th Framework Programme for Research and Development as part of the smart city strategy promoted across the EU (…)" (Nesti, 2018: 313).

as a methodology that seeks to create jointly a sensitive layer of complementary guidelines for programmes and projects brings about the issue of learning as an inherent part of the whole co-creation process.

Co-creation processes generate, at the same time, an open learning opportunity, because in a collaborative and interactive process different ideas can always arise, and their combination continuously helps to create new and diverse contributions. The results generated by a co-creative process can be also adapted along a value chain as the user needs change over time. In the framework of living labs, co-creation emerges as a procedural concept, with different stages of development and learning. This open learning perspective of co-creation can be considered in the preparatory phase, during the co-creation process and after each phase. Hence, in the scope of continuous learning, co-creation acts as an adaptive approach to tackle the socio-transformative needs of society.

FINAL NOTES

The chapter explores the potential of co-creation for the planning of public open spaces that could be more attentive to differences, inequalities and the diversity of social ideas, needs and preferences. In times characterised by uncertainties and cultural, economic and socio-territorial diversity, co-creation can be explored as an innovation opportunity to learn and (re)think urban planning. Exploring insights, literature and experience, the discussion calls attention to the "process" contexts provided by co-creation.

Co-creation can contribute to bridge the gap between socio-spatial references and representations, bringing together ideas, needs, availability and unavailability related with socio-spatial requirements. In this way, within a given objective, co-creation can: (a) attract different disciplinary fields and reinforce inter/transdisciplinary cooperation; (b) integrate different socio-spatial representations (from stakeholders, technicians, users …); (c) mediate opportunities, relativizing different positions and expectations towards a common decision; (d) emerge as a possibility to minimise localised problems, boosting more "feet on the ground" transformations; and (e) arise as an opportunity to create shared values within a socio-spatial community.

Co-creation implies an attitude of co-responsibility in detriment of ownership; it is collective construction, embracing different opinions and wishes, mediated and democratically managed. However, it imposes a perspective that in urban manage-ment and governance does not come easy. It requires a continuous learning process mediated by achievements and practical results, demanding a change of attitude, rather, a change of mindset in the process of creating, implementing and governing an open space from a transformative perspective that enables justice, equity, inclusion and sustainability.

Co-creation is, in fact, a challenge based on a perspective of distributive and interactive innovation, where the ownership has no relevance and the process

of creation, in principle, is open end. A challenge that, in light of the necessary transition to a more equitable and sustainable future for cities, allows us to foresee the utopia described by Foth (2017), decentralizing from only human issues, from design and planning methods, to methods focused more on a socio-environmental approach. Performing more co-creation processes along with processes of continuing and adaptive learning might be a way to a more inclusive and responsive public space.

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Participatory design as a tool to create resourceful communities in Sweden

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Abstract - *For decades, alternative (to carbon) sources of energy in Sweden have been linked to hydro- and nuclear power. However, this is set to change as the Swedish government's agenda has placed extraordinary emphasis on renewables. The implementation of renewables in Sweden poses several challenges. Literature shows that two main aspects deter local communities from embracing large renewable projects: lack of acceptance (of the impacts) and lack of participation (in the making and benefits). Sweden has a long tradition of stakeholder engagement in state-funded projects in the form of participatory meetings and written feedbacks. However, other participatory techniques are less established. Since 2014, we have engaged in research projects dealing with energy landscapes, design thinking, and what we have recently named "resourceful communities". The aim of this chapter is to report on the results of our recent projects that engage with the above-mentioned concepts/ strategies to foster collaboration and understanding between end-users and other stakeholders.*

Keywords - Energy aesthetics, participatory design, energy transition, resourceful communities

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INTRODUCTION: THE RISE OF RENEWABLE ENERGY PROJECTS IN SWEDEN

The Paris agreement calls for transformative steps to lower greenhouse gas emissions and deliver climate-resilient development. The implementation of climate and sustainability policies (see Agenda 2030), alongside the transformation of the European energy system towards a more decentralized system, will push energy production, such as photovoltaic (PV), closer to the final users, the majority of which live in urbanized areas. In Sweden, the country in which we are based, the provision of primary energy is dominated by hydro and, since the 1970s, nuclear power plants. However, since 1980, through an advisory referendum, Sweden has chosen to stop the construction of new reactors and slowly phase out nuclear energy, although a number of power plants were still commissioned through the 1980s and a number of reactors are still active today (Oles & Hammarlund, 2011). Further developments in hydropower are also limited since the exploration of the large untapped rivers is also prohibited by law. Therefore, since the 1990s, the question for alternative sources of energy has been one of the main issues on the Swedish government's agenda.

The energy transition poses several challenges to medium and small-size cities (65% of the population in Sweden) that have little capacity to steer such a process. In Sweden, there is a strong rhetoric for smart and attractive cities (Hidman, 2018). Smart and sustainable urban development is the latest mantra of city makers (i.e., planners, mayors, consultants, business, etc.) and scholars alike (Inkinen et al, 2019). This applies not only to the growing capital cities that are at the intersection of global trade, but also to medium- and small-sized towns located on the nation's periphery. However, recent research shows that seldom are smart-experiments able to transform society and its institutions (Savini & Bertolini, 2019). Most often, smart cities and resilience thinking do nothing to deal with the social and political aspects of human exploitation of nature at planetary scale, i.e. where most of the Earth surface is affected by urban-led extraction processes of raw materials, goods and food, and human bodies are used as cheap labor (Rizzo, 2019a). Although there is ample literature that criticizes smart cities from several angles - corporate storytelling (Vanolo, 2014; Cugurullo, 2018); one size fits all (Kitchin, 2014); political legitimization (Söderström et al, 2014) – our point of departure is that the issue of energy-system transformation is best tackled at the neighborhood-community scale. Based on this, we have set a number of projects to develop, test, and evaluate a method to transform cities into what we have termed "resourceful communities" (Rizzo, 2020).

Resourceful communities are not only "ingenious, able, bright, talented, sharp, capable, creative, clever, imaginative, inventive, quick-witted"[1] but are also communities that put the harnessing, caring, saving, and using of resources at the core of their action. Resourceful communities re-imagine the nexus between resource (extraction-

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[1] https://www.thefreedictionary.com/Resourceful

-processing-consumption) and urbanization in non-"predatory" (Rizzo, 2019b) terms, i.e. in ways that go beyond the cheap exploitation of nature by humanity (Moore, 2016). Our hypothesis is that a new paradigm is needed to facilitate the emergence or strengthening of existing resourceful communities, one which includes democratic design processes at the smallest urban scale, the neighborhood, to foster a new concept of energy-aesthetics. Therefore, our main research question is: *how is participatory design able to mobilize social creativity and democratize renewable energy projects?* Methodologically, we will deploy participatory design theory to deal with issues related to acceptance, democracy, and social creativity. In the remainder of this chapter, we will first shed light on the link between community opposition and forms of participation in renewable energy projects. After that, we will briefly present the methodology and results from our two case studies in Piteå and Luleå, both located in northern Sweden. Both cases explore the potential of deploying participatory design in renewable energy projects. In the conclusions, we will provide answers to our research question and problematize our approach.

THE IMPORTANCE OF RESIDENTS/USERS' PARTICIPATION IN RENEWABLE ENERGY PROJECTS

While this chapter reports on the results of two energy projects dealing with PV installations, most of the Swedish literature dealing with implementation issues for renewable energy projects comes from wind-farm studies. We will leverage this body of work because we believe that there are lessons to be learned from the many years of wind farm implementation in Sweden. One such a lesson is that of citizens' opposition to energy projects, a phenomenon sometimes labelled the NIMBY (Not In My Back Yard) syndrome (Wolsink, 2000 and 2007; Aitken, 2010). Today more sophisticated models have been deployed to understand the social, cultural, institutional, and physiological drivers of people's negative attitudes to renewable energy plants. For example, Wustenhagen and others (2007) have modeled social acceptance as the function of three dimensions: socio-political acceptance, i.e. acceptance of the policies and technologies to strengthen renewable energy; community acceptance, i.e. agreement on the siting decisions; and market acceptance, which is related to market adoption and innovation. In the two case studies presented in this chapter we will deal mostly with community acceptance.

Although Sweden is a heavily centralized state, its municipalities enjoy considerable power when it comes to land use. In practice, municipalities can veto any projects within their boundaries (Ek et al., 2013) unless these projects are the expression of national interests, such as natural conservation areas, or to protect people's health and security (Khan, 2003). Also, municipal land use monopoly has meant a great deal of different approaches when it comes to the implementation of renewables – from large, concentrated wind farms to scattered micro-plants (Khan, 2003). This has had both a positive and a negative outcome, where the former has fostered a place-based

approach while the latter has resulted in either extensive landscape impact or total opposition to wind farms (Khan, 2003). In our projects we explore issues related to small-scale, decentralized renewable energy projects because we think that these projects are more likely to engage with community needs and thus speed up the energy transition.

Sweden has a long tradition of stakeholder engagement in state-funded projects in the form of participatory meetings and written feedback. However, other participatory techniques are less established (Henningsson et al., 2014). Furthermore, individual and informal agencies, as well as small associations (in Swedish, förening), do not have the same visibility and influence in the planning process as other institutional stakeholders do. Adaptation to the impacts of energy projects has been shown to be an important factor to understand people's perceptions. It seems that after energy projects have been implemented, the previous negative stand of the affected inhabitants gives way to a more positive attitude (Warren et al., 2005) - this has been found not only for wind energy projects in Sweden but also for different types of energy-related projects, such as transmission lines in Finland (Soini et al., 2011). However, this latter position, people belated acceptance of energy projects, has been contested by Aitken (2010), who argues that people's silence on further energy projects may be also understood as unwillingness to engage in a cause where inhabitants have been previously defeated. Therefore, the way energy projects are designed and implemented may actually contribute to erode people's confidence in the ability to influence government's decisions, and result in the community's distrust of city administrators and energy businesses coupled with indifference to the green-energy cause.

However, besides the issue of engagement in the design stages of renewable energy projects, research has suggested that people are not only motivated primarily by quite abstract arguments but also by more tangible benefits (Bergström, 2007). Research in Sweden has shown that institutional factors, such as ownership, or the possibility to participate and affect how Renewable Energy (RE) is implemented in the local community may also be important (Ek & Matti, 2015; Ek & Persson, 2014). According to a number of studies, the adoption of benefits to foster individual ownership of small renewable facilities appears crucial (Rizzo, 2017). For example in Italy, the combination of market and government incentives has contributed greatly to expand the wind energy capacity of the country, and today Italy comes third in green-energy capacity in Europe, after Germany and Spain (Oles & Hammarlund, 2011). Following the example of Germany (Li et al., 2013), the introduction of Feed-In-Tariffs (FIT) to provide a stable and predictable source of income to individual green-energy users/providers has been crucial in countries such as Italy, Spain, and France.

Therefore, benefits alone cannot be assumed to solve community disagreements about the impact on renewable energy projects. By studying two renewable energy

projects in France and Germany, Jobert et al. (2007) have identified "local integration of the developer, the creation of a network of support, and access to ownership of the park" as the main factors to boost social acceptance. This is particularly true for countries with the weakest institutional framework on green energy, such as France and Italy, and the highest importance placed by their inhabitants on landscape to represent their national identities. A similar issue has been reported in Scotland, one of the countries with the highest potential for wind power in Europe but which is extremely reliant on its landscape, rather than cities, to generate income from tourism-related activities (Warren & McFadyen, 2010). By studying the implementation of an integrated, community-based green-energy project in a small community of Germany's Black Forest (Freiamt), Li et al. (2013) have found that the residents/promoters of the project were not only motivated by financial gains, but also by an intangible sense of pride in being a community 100% supplied by green-energy. Besides economic benefits, communities are motivated by their direct involvement as "prosumers", i.e. dwellers that are at the same time producers and consumers of energy, to make renewable energy possible - rather than solely commercial renewable energy development. Oles & Hammarlund (2011) have suggested that a place-based approach to locate renewable energy projects is needed if public concerns over the impact of the new energy systems are to be addressed. The results of their collaborative (university, county, municipalities) study in central Sweden show that it is not the technology that is perceived as a threat but rather the number, location, and identity of the owners that carry most of the importance for local stakeholders (Oles & Hammarlund, 2011). Therefore, the implementation of renewable energy is increasingly linked to the claim of legitimacy to be democratically viable.

TWO CASE STUDIES

To engage with the issues of democratic legitimacy and place-based approach, we present two case studies carried out in northern Sweden. The first case study is located in Piteå's Science Park, which is one of the locations of Luleå University of Technology.In collaboration with end-users (university employees and students) and stakeholders (the local energy company, the landowner, and the municipality), the project in Piteå sought to create an energy-smart university campus where not only energy production but also the development of public space was democratized. The aim was also to explore how art and architecture, as somewhat opposed to the successful economic driving forces, in the form of public installations, can work together to create an energy-producing public space. In addition, the installations work as a visualization of energy production and consumption, and aim to address and raise awareness of the production of renewable energy and the role energy plays in public spaces. The second case study was carried out in the neighborhood of Porsön in Luleå, and it included, among other elements, one university campus, rental

housing, and a science park (Fig. 1). In this instance, the local stakeholders were also involved (Luleå Energi and the municipality) as well as the students/residents of the area in the context of a university course the authors supervise yearly. The project overall purpose was to develop, test, and assess an approach by which (potential) prosumers could be motivated and empowered to integrate photovoltaic (PV) in the context of urban district regeneration.

Fig. 1: Study area in Luleå with the chosen spots for creative investigation. Source: the authors (2019)

Participatory Design as research strategy

In the authors' work with energy projects in Sweden, Participatory Design was deployed to engage users in the understanding and making of future energy projects. Mazé (2007) describes Participatory Design as a field concerned with the incorporation of end-users as full participants in development processes. It originated in the 1970s as part of the Scandinavian workplace democracy movement, whereby projects were developed with trade unions to incorporate technology in ways that enhanced, rather than replaced, workers' skills and local knowledge. Furthermore, Mazé (2007) compares participatory design to user-centered design, which draws on diverse means of studying, analyzing and incorporating user needs into product development, while participatory design focuses on means for opening up design processes, representations, and products to participation by stakeholders with diverse skills and expertise. Similarly to transdisciplinary urbanism (Rizzo & Galanakis, 2015), mock-ups, games, and enactment, for example, are simple means for everyone to represent and communicate ideas, regardless of design, technical or even language skills.

As previously argued, it is crucial to foster citizens' participation in renewable energy projects. Therefore, the participatory design approach played an important role in the development of both cases, in Piteå and Luleå, as a method to democratize the planning of public space to support the integration of energy-producing installations in the urban context. In addition, the research approach aims to improve the design process as well as the results, and, through collaboration with end-users and stakeholders, make sure that participants' needs are taken into account when developing urban proposals.

Methodology

As part of the concept development and design work in both projects, a series of workshops were held to involve stakeholders and other end-users (i.e. students and employees in and around the area) in the development process. The process was based on a participatory research design developed in a previous study called "sustainable municipality" (Ranhagen, 2011) and being used today in other flagship urban developments across Sweden (e.g., the Royal Seaport redevelopment in Stockholm – see Ranhagen & Frostell, 2014).

Phase 1

Both in Piteå and Luleå, the first workshops involved key actors in the area, such as real estate owners, representatives of the municipality and the energy company, business owners, educational staff, and so forth. They all had a legal or economic interest in the area. Based on the methods of participatory research design developed in "sustainable municipality", the participants developed the guidelines of the project (table 1) through structured brainstorming, a SWOT analysis, and by pointing out the technical potential of the area for developing renewable energy systems.

Existing technology (short term)	Smart engine heating system + combined charging station for electrical vehicles, design to show capacity and use of electricity Solar cells on windows, roofs, balconies Increase in public transport Visible storm water with multifunctional purposes, including aesthetic qualities
Developing technology (medium-long term)	Geoheating and cooling Pool sharing for new types of transportation Smaller and more adaptable solar panels Charging stations and wifi in all public spaces Flexible meeting places New forms of long-term energy storage Piezoelectric development
Experimental technology (long term)	Integrated technology for energy production in both large and small-scale components of buildings Portable stations for production and consumption of renewable energy in all different types of usage

Table 1. Results of the innovation model specifically for the Piteå Science Park.

Phase 2

In the second phase, participants/users (students, workers, etc.) were called upon to create posters and embark in actions on campus and through social media. Participants stated a number of reasons why they wanted to take part, for example they were "Intrigued by posters", "Wanted to influence the way the campus looks", "Interested in design and architecture". Based on the methods from design thinking as formulated by the IDEO founder and Stanford professor David Kelley, this phase was planned as a series of intense sessions focused on hands-on work and prototyping. Kelley (2013) describes "design thinking" as a way of finding human needs and creating new solutions using the tools and the mind-set of design practitioners, and divides the design thinking process into four steps: 1. Inspiration, 2. Synthesis, 3. Ideation and Experimentation and 4. Implementation (Kelley, 2013). In our projects, we went through steps 1 to 4 (see Fig. 2 to 4), while step 2 was formulated in Phase 1 of our methodology.

Fig. 2. Participants' Prototyping in Piteå. Source: the authors (2014)

Inspiration. The challenge and context of the project were presented to the participants. They were informed about the outcomes of Phase 1 as well as introduced to inspirational and innovative projects, which set the framework for the tasks. The challenge presented to the participants was: How can energy-producing installations be created which not only generate energy but also have artistic value and create added value to the people who use the area?

Ideation and Experimentation. The aim was to generate as many ideas as possible in a short time, make a selection of ideas that were further developed and tested through quick prototyping. As part of the design process in phase 2, the element of swapping
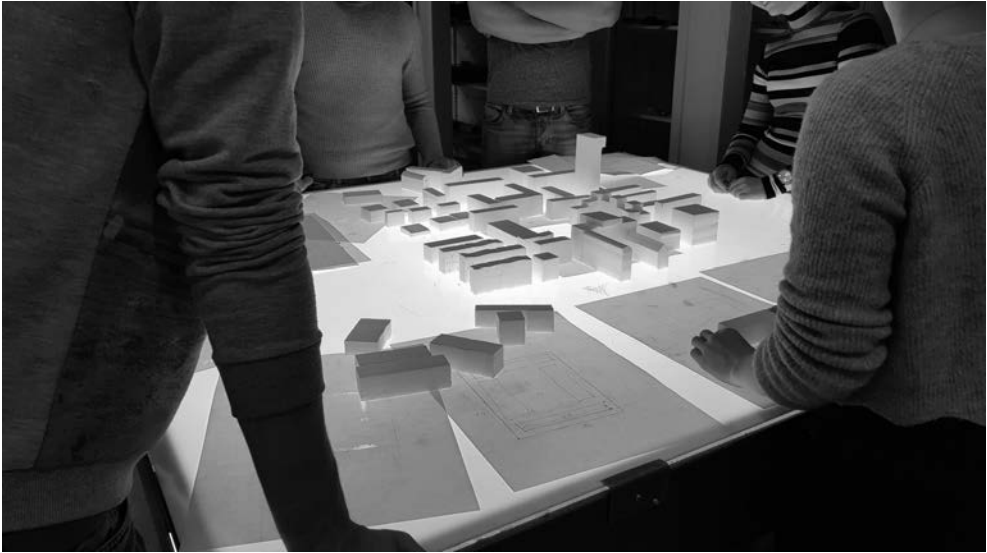
Fig. 3. Participants' prototyping in Luleå. Source: the authors (2018)

ideas between the three groups and working at different "stations" with different focuses for prototyping was added. The groups rotated between the three stations: Material, Form, and Place/Function. The swapping of ideas was used as an attempt to free participants from their first favorite ideas and in this way make the process more open-ended. Furthermore, the focus on material, form, place/function was added as an attempt to liberate participants from ideas about the aesthetics of public art installations as well as the aesthetics of energy stations.

The participants were divided into three teams and introduced to the first task, first individually and then as a group, which consisted in generating as many ideas as possible focused on the challenge presented. Before starting, they were introduced to some selected design thinking "rules" such as "think user-centered", "encourage wild ideas", "return to the challenge", "defer judgment", "go for quantity", and "build on the ideas of others" (Kelley, 2013).

When the teams moved on to the prototyping stations, they left their own ideas behind and took over another team's ideas for further development. The prototyping stations "Material" and "Form" were equipped with materials and tools suitable for quick testing and mocking up ideas. Station "Place/Function" was equipped with a scaled model of the campus area where the participants could work on their prototypes in relation to the design, architecture, and layout of the whole area.

At the end of the workshop, all teams presented their final outcomes. The prototypes were documented and collected for further development. In Piteå, this process was set up as a 2-day collaborative session with sketching and concept development until a final proposal with nine public installations was presented to the stakeholders.

Implementation. While the research project in Luleå is still ongoing, in Piteå after the presentation of the final proposal to the students there was a third meeting with the participants who attended the workshops held in Phase 1. Together, we conducted a criteria analysis based on the different proposals and related the proposals to the first workshop's analysis and innovation model. The participants were also free to elaborate on the given design proposals to optimize the outcome in relation to earlier results. Later, in 2016, the city of Piteå decided to build upon the work developed for the campus by recruiting an interdisciplinary team of practitioners part of which were already involved in Piteå. "Sun Wave" (Fig. 4) is an experimental solar park in which landscape and technical issues merge to face societal and climate issues as well as the needs of a northern community such as Piteå. The park was conceived as a "landscape room" made of 117 solar panels installed on wooden stands. The solar cells are two-sided and at the time of implementation it was the first large-scale PV facility in Sweden.

Fig. 4. Sun wave in Piteå: this experimental solar park was designed and implemented on the basis of the workshops in Piteå. Source: Ekelund, Bergström, Wiklund (2018)

DISCUSSION AND CONCLUSIONS

The production of small-scale solar power can, as is the case with all power production, be characterized by physical, environmental and institutional attributes that are valued by the local citizens. Impacts related to the integration of PV in neighborhoods can be positive as well as negative and may encompass, among other elements, perceptions about the extent to which the local population is involved in the planning and implementation process, who owns the facility, its physical characteristics as well as any monetary benefits associated with renewable energy

establishments (Ek & Matti, 2015; Ek & Persson, 2014). The development of renewable energy from an aesthetical and architectural point of view in a participatory design process defines the need for developing the normative framework. This adds an additional set of values to those associated with setting financial benefits at the centre of the debate. From the experience gained in Piteå and Luleå, there are indicators on the importance of including people both in the development of renewables but also the need to introduce the dialogue based on other normative frameworks.

In this chapter, after sketching the growing importance of renewable energy projects in Sweden, we have reviewed the main factors hindering and promoting community participation in renewable energy projects. We have argued that a more inclusive idea of renewable energy can strengthen the transition to resourceful communities, i.e. communities that are formed by energy prosumers rather than mere consumers. In both case studies presented above, we have worked with users to test participatory design and place-based approaches that could be acceptable to the wider community as well. Our initial research question was: how is participatory design able to mobilize social creativity and democratize renewable energy projects?

We believe that the projects discussed above give indications that there is great interest from companies and citizens to take an active role in the development of public space. The participatory approach helps to democratize this development as well as to create a shared interest among companies and citizens. In addition, the participatory approach is beneficial for the design process itself since it opens up to less conventional outcomes. We found that involving people with a different set of skills and knowledge was more enriching than leaving all of the design work to architects alone. The effects of the proposed installations are most likely to create daily based impacts such as sound, visual moving elements, and solar reflections. However, in this case these attributes are all part of the installations and hence not addressed as problematic or disturbing by the participants, all of whom are a sort of "developers/designers" in this case. This indicates that the aesthetic values of renewables might undergo a similar transformation as, for instance, sound in general. For instance, the sound of water running might be experienced as positive, while the sounds of cars might not.

From a political point of view, the development of sustainable energy systems is dependent on people's experience of their implementation. Through the perception of the built environment, norms based on the experience of past examples are created, which facilitate or, conversely, obstruct their continuous development. These norms usually depend on economic, ecological and social descriptions of energy. To a certain extent the meaning of energy in this study is focused on the aesthetic and artistic expression as a way of questioning the validity of given norms, many of which have a predatory urban character. And in this case the questioning of norms is actually constructed by the very participants of the design process. The results

have shown that questioning the given norms of aesthetic values of renewable energy can greatly contribute to enhance the popularity and uptake of renewable energy systems. However, although the Luleå case study, unlike Piteå, included a large residential area (rental housing), our approach needs to be tested in urban contexts different from that of a university campus, contexts with a different socio-economic setting in which it could perhaps be more difficult for design-based methods to yield results. These possible limitations should be further explored in future studies.

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Placemaking with teenagers. Experiences driven from thematic workshops on urban planning.

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Abstract - *This chapter discusses topics of interest produced in the context of a pilot phase of thematic workshops on urban planning with teenagers in the Alvalade neighbourhood (Lisbon). The workshops were developed to encompass topics of interest relating to teenagers' perceptions, representations and uses of space. Another focus was on perceptions and uses of Information and Communication Technology (ICT). Finally, the workshops tackled the opportunities for participation and civic engagement and teenagers' contribution in the design and planning of public open spaces. On the one hand, this contribution reflects on how to engage teenagers in critically thinking about the city-making process. Along this line, it reflects on teenagers' participation and placemaking and compares initial expectations of researchers with the emerging topics of interest arising within the workshops. But also, on the other hand, it ponders on how to promote in these students a more active civic participation. It is suggested that education for citizenship can be indirectly addressed and explored through the activities conducted within the urban planning workshops. And, through this, another goal can be achieved: empowering teenagers with tools and knowledge to become more active and engaged citizens. Even though this was not initially planned, and therefore no formal evaluation of such results was conducted, it leaves room for reflection in the present and for future work.*

Keywords - Public Open Spaces; teenagers; citizenship education; ICT; placemaking

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INTRODUCTION

The role of citizens in the process of transforming and building their environment has been widely discussed and put to practice through several strategies and mechanisms: either formal or non-formal; promoted by the state or by citizen movements, on a city scale or neighbourhood level (Wilhelmer, 2016; Holmes, 2011). Placemaking encompasses several concepts which operationalise such notions. Placemaking ideas came to be through the work of Jane Jacobs and William H. Whyte, who highlighted the relevance of active neighbourhoods and attractive public spaces for social and cultural well-being (PPS, 2018). Overall, placemaking seeks to promote the creation of attractive places that people will more likely care about and relate to, where they would want to be and feel safe in, and where different facilities and experiences can be offered.

However, not all citizens are given the same possibilities and opportunities to participate and manifest their expectations for the places where they reside, for example, due to socioeconomic, educational or age status (van Holm, 2019; Armingeon & Schädel, 2015; Stephens, 2012; Valentine, 2004). Hereinafter, this chapter will have a twofold focus. First, on teenagers who are, due to their age, excluded from this process of participation. Second, on the strategies available to counteract this reality and engage them in the process of city-making, enabling them to be active citizens. Placemaking can be one of such approaches, building bridges between professionals and several other stakeholders.

As is the case with other age groups, teenagers have unique and specific interests regarding space in a city. Despite this well-known fact, their needs and wishes are not always accounted for by those who plan and design cities and their public spaces, being often withdrawn from engaging in the process and denied the right to exercise their citizenship. Adults decide on their behalf assuming they are acting in their best interest. This is caused either by an advocacy that teenagers should not be deprived of a life free of worries, or by an assumption that they are not sufficiently equipped to make decisions on their own (White, 2001; Laughlin and Johnson, 2011; Valentine, 2004). As part of the activities undertaken within a European research project, a series of thematic workshops on urban planning were conducted in Lisbon. The activities were designed and implemented to test possibilities to engage teenagers in placemaking, and explore teenagers' representations and needs regarding public open spaces. The pilot phase engaged forty-nine 10th grade students, aged between 15 and 19 in a secondary school in Alvalade (Lisbon) during the 2017-18 academic year. The workshops totalled 24 hours of contact divided by 90 minutes sessions. The workshops and their objectives were planned, but the activities were designed as the sessions were taking place, providing students with the opportunity to contribute with ideas and adjust the activities to their emerging requests. This chapter confronts results from the pilot phase of the workshops with researchers' initial

expectations, discusses topics of interest emerging from the activities, and reflects on teenagers' participation and placemaking approach.

PUBLIC SPACES UNDER THE EYE OF TEENAGERS: IN LINE WITH CITIZENSHIP EDUCATION

Public space is a privileged gathering place for individuals, a place where citizenship can (and should) be exercised. The responsibility for the creation and conception of these public places falls upon institutions of power. And upon citizens falls the awareness of their role in society to be participants in the enhancement of what belongs to the community. Analysing the concept of public space is understanding its structure in the evolution of contemporary society. Reflecting on public space implies thinking space as a resource, a product, a social, political and symbolic practice, a place which serves citizens, and where they can gather to express a public opinion. In other words, this involves considering public space as part of the sphere of public power (Habermas, 1984). When we talk about citizens, we cannot dismiss their right to exercise their citizenship and manifest their opinions and needs publicly. However, some groups, such as teenagers, tend to be disregarded and their needs neglected. And indeed, during the process of city planning and design, teenagers' opinions are frequently not heard. Justifications for this are adults' perception of teenagers as lacking the necessary attributes, e.g. responsibility, motivation, competences, interest, legitimacy or power, to participate (Laughlin & Johnson, 2011; Passon, Levi, and del Rio, 2008). Nevertheless, teenagers, as users of public spaces and as citizens, have a voice that must be heard and needs that must be satisfied. Hence, citizenship education, as an empowering tool to engage political and civil society, both at individual and group level (Schugurensky & Myers, 2003), should be a goal of all governments with a view to bringing up active and transformative citizens (Banks, 2008). This will reflect the pertinence of space as a product at the service of its users (Lefebvre, 1973). It is commonly accepted that national governments have been given several forms and levels of education as a way of fostering knowledge, skills and virtues necessary for youth to become "good citizens". However, it is known that most citizenship education was developed to be an instrument to keep and reproduce economic, social and political structures of society (Giroux, 1980).

The city is understood as a public space project, a product intended for the use of those who will appropriate it. Teenagers, as users, must be in line with the processes of knowledge production and planning of public space. That would only be a reality if they are granted the opportunity to participate and contribute, and the recognition that they possess the necessary creativity and capacity to transform and shape their communities and societies.

In the dimensions that Borja sets forth for public space on the social and cultural scale, the interdependence of this trilogy: city – public space – citizenship, it is argued

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that "(…) our life depends to a large extent on this relation (…)" (Borja, 2003: 22). The underlying thesis is that none of these concepts can exist independently. In this sense, individual rights per se do not necessarily entail a participation in the formation of the city; therefore, a fully-exercised citizenship is needed for collective and active city shaping, as well as for the construction of significant places for its citizens.

It is so much in this sense that public space is presented as the prime space to facilitate dialogue, experiences and social cohesion. Public space gives way to the objects and sets them in the territory, drawing to itself different users. In it lies the gathering point, which unveils those who come to it and stay there if an empathy with space is developed (Lourenço, 2019). The importance of citizenship education as an instrument to empower teenagers should be not only conceived as a set of rhetoric rights, but understood as a way of living, for the individuals and for the social well-being. This kind of capacity may prove difficult to implement due to the lack of knowledge of concepts but that does not mean a lack of ideas. Concepts can be learned; a lack of ideas denotes an absence of freethinking and a fragile grasp on citizenship. The ability to co-create new "empathetic" spaces accordingly to the needs and wishes of teenagers should begin with giving them space to interact with local authorities – a way of getting out of rhetoric lines into a participative line.

Following the above-mentioned theoretical assumptions, a series of thematic workshops on urban planning was designed. The purpose was to operationalize and implement such premises so as to bring some insights into the research project in which they are integrated – whose goal is to develop strategies (co-creation) and tools (ICT) to increase the quality of public open spaces and social cohesion effects. The sessions, goals and results of the workshops will be presented in the next section.

THEMATIC WORKSHOPS WITH TEENAGERS

A series of thematic workshops on urban planning was developed in Lisbon aiming at designing recommendations for more attractive, responsive and inclusive public open spaces. The target group was constituted by teenagers and the area of study was the Alvalade neighbourhood. This neighbourhood is located in the north of Lisbon and is a well-known example of a planned and structured neighbourhood, established by The Urban Development Plan of Alvalade (1930-45), designed by João Guilherme Faria da Costa. In this neighbourhood many public spaces can be found, both open and closed, with different functions and uses. The residential areas are mixed with retail zones as well as services and equipment for daily use (Costa, 2002). A neighbourhood school was involved, as partner, to facilitate access to teenagers. The fact that the school was participating in a pilot project led by the Ministry of Education that allowed it to decide the curricular content for a certain number of hours also facilitated logistics. Two 10th grade classes (N=49, aged 15 to 19) were engaged, chosen for participation by the school administrator.

Fig. 1. Outdoor activities – observation of public open spaces
in the Alvalade neighbourhood. Photos: C3Places Archive.

Fig. 2. Interactive class discussion of public spaces.

Conceived to engage students in different achievements, the thematic workshops had four major purposes. Firstly, they intended to raise interest in urban space through the discussion of opportunities and problems present in public open spaces, and to debate ideas on the uses of Information and Communication Technologies (ICTs) to increase public open space use. Secondly, they were expected to encourage outdoor activities. This was accomplished by sessions in outdoor spaces in the Alvalade neighbourhood, as structured observations of public open space (Fig. 1). Other activities were designed for the classroom, such as interactive discussions, with sticky notes, where teenagers explored their ideas on the ideal public space (Fig. 2). Such activities aimed at exploring and discussing teenagers' knowledge of

public open spaces and the role of public space in improving environmental quality and increasing citizens' quality of life. Thirdly, with the students' input, the thematic workshops aimed to develop arguments to question whether public open spaces answer their needs or not, incorporating the role of ICTs for future public spaces. Finally, it was expected to introduce the scientific research process, discussing and presenting research methodologies and the applicability of research findings to citizens' daily life. In the meantime, a preliminary report was published which provided reflections on the process of development and implementation (Almeida et al., 2018).

In this way, four themes were tailored to operationalise the above-mentioned goals, and each paralleled a thematic workshop composed of four sessions. Thus, for each theme specific activities were developed to engage teenagers:

Thematic workshop 1 – "A critical look at the city" aimed at presenting, conceptually and practically, cities, urban planning, urban morphology and the role of public open spaces. Activities consisted of: 1) a theoretical introduction and presentation of the project, workshops and expectations; 2) an expedition through the Alvalade neighbourhood to observe and describe the space; 3) a semi-structured interview conducted by teenagers to their colleagues to explore their perceptions of their neighbourhoods and introduce the scientific research process; 4) and, finally, a discussion of concepts, perceptions, uses, and problems in public spaces. Researchers also passed on a brief questionnaire to assess students' demographic profile, use of ICTs and use of public space.

Thematic workshop 2 – "Construction of the city" was conceived to address the planning and building of cities, their social and environmental role, opportunities to participate in the planning process, and discussing tools and projects addressing these topics. The activities entailed two sessions with professionals. The first session, held with representatives from the Alvalade Parish Council (Public Space Division)[1], introduced public policies, strategies and demands in constructing or transforming public space in Alvalade, in general and in regard to teenagers' needs. In the second session, tools and opportunities to participate in placemaking were discussed. This session was attended by the Parish Council representatives, members of a civic movement[2] and by a representative of a digital crowdfunding platform[3]. Another activity involved discussing values, ideas and identified problems in the communal urban resources. Finally, a discussion of different transformation proposals took place, and a consensus had to be achieved considering the different needs and interests of multiple actors and on the participation opportunities, tools and processes discussed in the previous sessions.

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[1] https://www.jf-alvalade.pt/

[2] The movement Caracol da Penha developed a proposal to transform a derelict space into a public place. This proposal won Lisbon's Participatory Budgeting in 2016. https://www.caracoldapenha.info.

[3] PPL platform. https://ppl.pt

Thematic workshop 3 – "The digital era and the city" sought to address ICTs and lifestyles, exploring how the digital generation perceives itself and the role of ICTs in the production of cities. A presentation of different inputs and information on technological advances and transformations brought (or not) to the city was provided. The screening of a documentary on different dimensions of and perspectives on technology was another activity. Outdoors, teenagers observed (with the assistance of a recording grid) the presence of ICTs in public open spaces in Alvalade and the uses of public open spaces. In the last session students organized and mediated a debate on the advantages and disadvantages of digital technology.

Thematic workshop 4 – "Project and design of an urban public open space" sought to discuss the planning and construction of public open spaces, considering technical, social and environmental aspects. It aimed at debating the history and role of public open spaces in the city and examining the needs, expectations and preferences of different users. It also involved recognising the interactions between users and possible conflicts that may arise while competing for available space. Activities in this final workshop were more directed at understanding how space is designed and projected, with exercises to explore spatial representation (orientation, scale, shapes, designs and descriptive documents) required in the design of proposals. An activity to practice the design of proposals for the school yard (well-known space that they could see from the classroom) was assigned to students. Finally, they were asked to translate their needs, ideas and preferences regarding public open spaces into a proposal for the transformation of a public open space in the Alvalade neighbourhood.

As mentioned above, these goals were operationalised as the sessions were being implemented, to allow students' needs and ideas to be addressed, as well as to better deal with the external factors (such as the weather) that constrained some of the sessions. The next section will confront the initially established goals for the workshops with some preliminary results drawn from the analysis conducted so far.

TEENAGERS' RESPONSE TO THEMATIC WORKSHOPS: EXPECTATIONS VS RESULTS

The workshops produced varied materials. A methodological decision was made by the researchers on which data should be analysed in more depth. Such materials as questionnaires and the facilitators' observational notes, as direct tools for data collection, were prioritized. Questionnaires had closed questions, which were analysed quantitively, and open questions, subject to thematic analysis (Braun & Clarke, 2006). Other data resulting from materials that provided support for the activities and exercises complemented and reinforced these analyses. Materials were compiled, organized thematically and qualitatively analysed by researchers. It is important to clarify that most of the analysed materials (except for the questionnaires) emerged from the workshops' interactions. In other words, in many of these materials the data, ideas, needs or proposals that were collected emerged from collective

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reflections and discussions. In varying degrees, depending on the material, the workshop facilitators and the teachers that accompanied the class also intervened.

While discussing and testing interactive activities to engage teenagers in placemaking we need to acknowledge that the process is always a contextual one. External factors influence activities, adding a feature of unpredictability that may hinder the design of generalised recommendations. In the development and implementation of these urban planning thematic workshops, some external factors, such as weather conditions and school organizational and administrative processes[4], influenced (either for better or for worse) the outcome of the sessions or of specific activities (Almeida et al., 2018). However, that is not necessarily negative. providing instead opportunities for more flexible processes of placemaking (and we can wonder if also of research). Adaptability to the needs and preferences of the engaged audiences is paramount, as it translates into a final product that is also flexible, with a higher capacity to adapt to users' needs and to attract people.

The results from the four thematic workshops, in general, pointed to an adequacy of the process and the achievement of the pre-established goals. Due to the cumulative feature of the workshops and the articulation of themes and activities, the reflection on expectations and outcomes was done transversally. Data of interest to reflect on each of the themes and on teenagers' perceptions were present across sessions, regardless of which workshop focused on a specific theme. The main> reflections of interest emerging from the thematic workshops can be organized in the following topics:

Perceptions on space and use of space: Regarding teenagers' knowledge of city concepts and city morphology, it was manifest, throughout the sessions, a lack of information on such notions and concepts. It was not possible to ascertain why teenagers had such a poor grasp of these concepts, but a possible explanation is their absence from the formal curricula. From the first session, concepts of urban planning were introduced to be later used in several activities. During the subsequent activities it was noticeable that these concepts were appropriated and correctly applied.

In the first session, teenagers were asked to complete a questionnaire to draw their demographic profile, use of ICTs, use of public open spaces (quantitative – closed questions) and their perceptions on space (qualitative – open questions). Their perceptions on space were assessed by open questions: known spaces near their home and in Alvalade[5]; what was understood by concepts of city, public space, urban

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[4] For example, the mandatory presence of a teacher during the sessions meant that when the assigned professor was absent the session could not occur.

[5] As later revealed by the profile information of the students enrolled in the workshops, only 15% are residents in the Alvalade neighbourhood, the majority live in other Lisbon neighbourhoods and even in other municipalities. While developing and operationalising the sessions, the data from students' registration in the Alvalade School Group already revealed this situation. For this reason in the questionnaire the differentiation was made between spaces in Alvalade and near home. The goal was to capture a better image of the use of public space and to compare possible differences between public space use near the home and near the school.

planning, public space maintenance; perception of personal contribution to planning; and short description of their neighbourhood. Qualitative data from questionnaires was also explored in Smaniotto Costa et al. (2018), in a discussion of young people's broader representations of the relation between people – public places – and ICTs. A second questionnaire was also developed, aimed at providing a base for students to question each other on how they saw their neighbourhood (what they liked/ didn't like, problems and solutions, better and worse places in the neighbourhood, use of public open spaces and activities, and general evaluation of the neighbourhood). Answers were written down by students and transcribed for analysis. From the last section of the first questionnaire (Q1), from the second questionnaire (Q2), and from an analysis of the final discussion from thematic workshop it was possible to ascertain that teenagers' perceptions on space could be divided into two dimensions. A first dimension referred to conceptual perceptions. Although simplistic, incomplete and, in some cases, revealing misconceptions, teenagers' conceptual perceptions encompassed many of the different levels (demographic, social, and subjective features/physical, material, and administrative features) at play in the theoretical discussion of the urban fabric and public spaces. And a second dimension addressed perceptions on space put in terms of experience of space (either direct, through use, or indirect, through proximity).

Another topic of interest is related to the perception of the neighbourhood. Most of the students had a positive opinion/experience of their neighbourhood even when the perception of others is negative ("I like my home, even if [located] in a known confrontational neighbourhood, because there's a lot of turmoil there" (Q1 – Respondent 13). Neighbourhood is also seen as positive even when negative features are identified ("In my opinion there is nothing interesting about my neighbourhood. Nevertheless, I like living there, since it is a quiet and tranquil neighbourhood" (Q1 – Respondent 36). The latter quote also reveals a common trait identified in Q1 and Q2, associating a positive experience of the neighbourhood with features of calmness, tranquillity and peaceful environment. Other characteristics that making their neighbourhood a good place to live were the existence of services and infrastructures, and the residents and their interactions. Those who have a negative opinion/experience of their neighbourhood justified it as a consequence of specific features such as location/difficult accessibility, feeling of social exclusion, insecurity and unattractiveness. Matters of accessibility and public transportation were recurrently pointed out by teenagers as important.

The role of public open space was introduced, and its social and environmental benefits discussed. From class interactions, the use of public space by teenagers appears to be low; however, this contradicts findings from Q1 (section on use of public space) – 81% use them frequently (sometimes during the week – 65%; many times, during the week – 10%; and daily – 6%). Still, there is a need to balance reported use of public space against observed difficulties in understanding what

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qualifies as public space (a topic to be developed in the following section). Different types of public open spaces where identified by teenagers, namely, parks, gardens, squares and streets. A comprehensive list of known public open spaces, either near their homes or in Alvalade, was compiled. Almost all students identify a park or green area near the place they inhabit and point out different purposes for using it, such as physical activity, being with friends or family, walking the dog, playing and doing sports. In Q2, when asked to identify the best places in their neighbourhoods, the majority (15) identified public spaces, mostly gardens and parks.

Despite teenagers' positive reflection on the urban fabric, until the end of the sessions teenagers' difficulty in differentiating public open spaces and public closed spaces and/or privately-owned public spaces persisted. In Q1, when questioned about what spaces they use, the most frequent answers point to commercial spaces such as shopping centres, coffee houses and restaurants and markets/supermarkets (near the home, 33% of answers and in Alvalade, 25%). Overall, they consider public closed spaces such as shopping malls to be open spaces, highlighting the possibility to access it: if it is open to the public and its entry is free of charge, teenagers perceive the space as open and public. Teenagers also reveal they do not feel unwelcomed or excluded from this type of spaces, neither perceive limitations in their use.

Participation: Prior to the thematic workshop on participation, teenagers were questioned about what they perceived to be their contribution to planning (Q1). Most answers indicate either a passive contribution, like maintaining existing conditions of the spaces they use, or a more active contribution but in very specific instances, for instance, recycling, identifying problems and keeping the spaces clean. Thirty seven percent (37%) didn´t reply when asked how they could contribute, which may reveal a lack of understanding by teenagers of what would be expected of them if they were allowed to participate in urban planning. This was also observed during class interactions, especially when discussing proposals for public open spaces.

In the second thematic workshop, teenagers were confronted with several means available for civic participation, listening directly to contributions from public authorities, grassroots movements and private/market initiatives (Fig. 3).

Taking the first – the state – teenagers were almost automatically excluded, since the most common strategy involves participatory budgets. The presentation of proposals used to be available only to people over 18 years old, but it was mentioned by the authorities that it will became available to all aged 16 and older. However, this still echoed little with this group of teenagers. Representatives discussed other strategies that could be used to communicate with local authorities and propose specific solutions or ideas, but not specially designed for youngsters. Nevertheless, teenagers seem to manifest a generalized lack of interest in taking part in any civic action. Mostly, they are fully aware of the temporal gap between

Fig. 3. Session with representatives from local authorities, grassroots movement and private/market initiative.

discussing, deciding and implementing any ideas. Teenagers are mindful that they will hardly ever benefit from any result arising from such a participatory process. It was not possible to fully explore the conditions and opportunities for teenagers' voluntary participation and engagement in placemaking because the thematic workshops were developed under a context of formal education, and this influenced the process. It was convenient, by providing access to a public that is difficult to engage in after school activities and ensuring their regular presence. On the other hand, though, in school activities (as was the case) participation was mandatory, which compromised a neutral assessment of teenagers' motivation.

Use and advantages and disadvantages of technology: The pervasiveness and ubiquity of ICTs were discussed with students, e. g. in exercises to stimulate teenagers to reflect on ICTs and discuss ideas with peers (Fig. 4).The materials analysed from thematic workshop 3 and from the questionnaire section on the use of ICT allowed us to explore teenagers' perceptions and uses of ICT. Teenagers recognize its impact on their lives, particularly on the social dynamics, and can recognize and coherently discuss the dangers and benefits associated with ICT, for citizens, families, communities and cities. They recognise the importance of ICT in the city, expressing the possibilities to create a more connected, efficient and sustainable city. But, on the other hand, their discourse reveals a heightened concern with the consequence of the excessive use of ICT on the quality of interpersonal relationships and on psychological well-being. Also, teenagers didn't recognize the presence of ICT in public open spaces as paramount to increase their use of a place. The only reference was made to the need for wi-fi signal, so they can use their

mobiles in public spaces to conduct the most frequent activities: navigate social media and chat online.

Fig. 4. The digital era and the city, indoor session.

Teenagers are frequent users of mobile devices – only one of the Q1 respondents didn't have a smartphone and 91% stated they were either 'constantly/connected all the time' or that they connected to the internet several times during the day, mainly for social purposes. Despite this frequent use, they weren't too keen on using their mobile phones during the sessions. As justification for this, they mentioned limited mobile data and the lack of memory storage capacity. It is expected that activities using ICT tools will be conducted in a subsequent phase of the thematic workshops with teenagers. However, in this first phase of intervention the process was "analogue" using "traditional" research tools and non-formal education principles.

Needs and ideas for public open spaces: A goal which had been set in the operationalization of some activities and which was not achieved was the direct identification of a single public open space in Alvalade which proved relevant to teenagers. The idea was to have them use this space as reference for the design of proposals and ideas for transformation in thematic workshop 4. However, during the sessions, the teenagers' struggle to identify a single public open space of reference in the neighbourhood became increasingly apparent. This can be explained since many live somewhere else and their spatial reference in Alvalade is only around the school or along the circulation paths between the school and the main transportation stops. Although the largest green area in the Alvalade neighbourhood – José Gomes Ferreira Park – is located very close to the school, and though it was mentioned often in the different materials, it became clear, from class interactions, that teenagers do not use this public space often. The public open space of reference

for the thematic workshop 4 was then, due to these circumstances, chosen by the researchers based on structured observations. Marquês de Soveral Street, right in front of the school is a space used by students before and after classes and during breaks, and was therefore selected. Teenagers proposed, for this space, more parking, better accessibility, more greenery and equipment, such as benches, a kiosk or a playground. A reconfiguration of traffic was also suggested to broaden the available space and change the location of an intersection crossing. The final product was not the same in both classes – one produced a more structured descriptive memory (Fig. 5), the other a less structured set of ideas and identified needs. When addressing the suitability of a public open space to their needs, teenagers focused on the quality, diversity and availability of services and infrastructures, namely cafes, bathrooms, sports areas, water fountains, to name a few. And of extremely high importance to all of them was the existence of a good network of public transportation around the area. As mentioned above, many students live outside Alvalade or even Lisbon, which increases the importance of this service in their use of public space.

Fig. 5. Design of proposals for a teenager-sensitive public open space in the Alvalade neighbourhood.

CONCLUSION

This chapter aimed at reflecting on teenagers' participation and placemaking. A comparison was drawn between the initial expectations of researchers regarding a series of thematic workshops on urban planning that took place in the Alvalade neighbourhood (Lisbon) with the emerging topics of interest arising brought up by the teenagers involved. The reflections from the workshops' pilot phase allowed for a more informed development of the following sessions – which will take place in the same school, but with a different group of students.

Teenagers are a group with particular needs, interests and aspirations, which are visible in all the scopes of their existence as individuals and as members of society. When considering instances of planning and design of public open spaces, teenagers' contribution is paramount for developing adequate places. When we consider teenagers in a broader sense, their needs and ideas hardly influence policies for many reasons. They are not often heard or invited to participate in the different processes of decision-making. Participative tools and processes frequently have age limitations which also exclude them. Moreover, teenagers themselves are not sensitive or motivated to participate, plus the tools to express their ideas are absent.

Furthermore, teenagers' education remains, in general, highly formal. Still, on a positive note, it has become increasingly more focused on matters of citizenship education, civic participation and articulation of the curricula with the local reality of students. However, citizenship education as understood in the curricula is neither clear nor effective. It gives precedence to civic education, of a purely formal nature, showing little initiative and student interaction with local communities. From this perspective, the "civic participation" of teenagers has been based on the acceptance of already defined social structures, to the detriment of critical thinking which truly truncated with the local context, thereby depriving them of an effective and enlightened public life. However, the experience of thematic workshops on urban planning discussed in this chapter revealed the potential of non-formal and interactive education – leaning via flexible activities and subjects complementary to the official curricula – by taking the "classroom" into different locations, such as the public open space. Experiences of engagement as this allow to raise teenagers' awareness to the space around them. Their formal educational setting can, then, be articulated with broader locations where social practices, norms and interactions take place at societal level. For teenagers, to ponder on the strategies to propose transformations of public spaces or on how to express their needs to professionals is not innocuous. It may constitute the spark that ignites their capacity to reflect on their broader role as members of society and on their rights and obligations as citizens.

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The design of co-participation processes in public spaces in São Paulo as university extension project: The revitalization process of Dom Orione and Major Freire Squares

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Abstract – *This work discusses the revitalisation process of Dom Orione Square and Major Freire Square, developed in a university extension project by architecture and urban planning students of Centro Universitário Belas Artes in São Paulo. The Dom Orione project was conducted jointly with Association Novolhar, which provides social inclusion to children and teenagers in need living near the square. Even without a proper playground, the square is used by children all through the week. At weekends a flea market takes place, with local vendors using improvised tents for selling antiquities. To better understand the children's expectations, the students organised a design and sculpture workshop in which children could express, the changes they wanted in the square in a playful manner. Through the drawings and clay sculptures, the students were able to create a project that met the needs of the local population. In the Major Freire Square, the project was developed in partnership with the NGO "EU RESOLVO", taking also into account the needs of local residents. Due to its proximity to the São Judas subway station, Major Freire Square has a great potential for recreation activities. The students organised meetings with the local population to discuss their needs in order to create a project suited to the locals. It is believed that participatory processes are fundamental for the training of architects and urban planners sensitive to the real-life issues of the city. Consequently, the appropriation of public spaces by the population in general and by children and adolescents in particular, will be better understood and taken into account. In this way, discussing methodologies and development alternatives by participatory projects contributes to future public policies and to the development of responsive public spaces.*

Keywords - *Children, Public Spaces, Squares, Co-Participatory Processes, University Extension Project*

INTRODUCTION

This chapter addresses the experience in co-participation process and the methodology used in the revitalization projects of "Dom Orione" Square and "Major Freire" Square, conducted with the architecture and urban planning undergraduate students of the Higher Education Institute (IES), under the ARQUICRIANÇA University Extension Project of Centro Universitário Belas Artes in São Paulo, Brazil. University extension projects in Brazil have been understood in the last decade by higher education institutions as an interdisciplinary educational, cultural, scientific and political process based on the principle of the inseparability between teaching, research and extended learning. Hence, an extension activity reaches its effectiveness when it is linked to training in the students teaching and the generation of research knowledge. The connection between teaching, research and extended learning in the training of undergraduate students articulates the university and society, in the tripartite pedagogical axis "student / teacher / community", while placing the students as protagonists in the process of citizen education 'which allows him/her to recognise him/herself as an agent for guaranteeing rights, duties and social transformation' (Ministério da Educação, 2018: 09). Hence, it is emphasized that the production of knowledge through extension projects is supported by participatory methodologies based on research/action with the engagement of different social actors.

Concerning the right to education for all citizens, it is worth mentioning the Universal Declaration of Human Rights, proclaimed in 1948; the Brazilian Constitution of 1988, the National Education Plan of 2014, as well as other instruments that aim to guarantee these rights. That should be achieved by bringing educational institutions closer to the community, and including convergent knowledge, values and practices in the defence of human rights. One of the principles of the pedagogy elaborated by the Brazilian educator Paulo Freire[1] is the "problematizing education," which correlates the individual's contexts and life experience in the process of personal transformation, in order to stimulate the critical awareness of reality and the active involvement of students and teachers in the teaching/learning process with the action/reflection/action strategy. The teacher assumes an important role by questioning, but mainly by knowing how to listen to the diversity of students' realities and contexts, using dialogue as the main teaching tool. The participatory design process in architecture and urban planning provides a way to capture the social and political dimensions as matters of collective interest. In those cases, the opinion and needs of (future) users must be considered in order to ensure the best appropriation of the city's public spaces (Sanches, 2015).

According to Pronsato (2005), participatory design projects are concerned with the collective achievement of rights, focusing on the citizenship and the affective bond

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[1] Paulo Freire was declared Patron of Brazilian Education in 2012 (Law 12,612 of April 13, 2012).

with the place. The author stresses the importance of reciprocity in the relationship between architect/user and teacher/student, not only during the process of constructing collective knowledge, but also during the construction of spaces. Both the consciousness of the other and dialogue are instruments of the interactive teaching attitude. Pronsato (2005) reinforces the importance of the educator Paulo Freire, who illuminated the educational spaces from interactive relations, transcending the formal space to reach the informal "in the city that stretches as an educational tool". Inspired by the possibility of articulating a dynamic and interactive pedagogical practice and correlating it to the practice of an architect and urban planner acting in/with society, it is possible to build a co-creative, co-participatory, inclusive, receptive designing process, which sees the human as a social being "not only in the world, but with the world" (Pronsato, 2005: 49).

In general, public places in Brazil are abandoned. Their uses do not correspond to the prospects of the original project. The urban analysis of the city developed by architects, students, and all the professionals involved with public policies and public space projects should reveal not only the territory, but especially the people, with their dreams and expectations. In his book Politica e Educação (1997), Paulo Freire reinforces the need to recognize the city as an educational entity "indepen-dent of our will or expectations (...) for the need to educate, to learn (...) to create, to dream, to imagine that we all (...) occupy its streets, its parks, its buildings." (Freire, 1997: 23). Additionally, Freire stresses the idea that the city is culture, so we create in it and with it:"(...) The city is us and we are the city (...). As an educator, the city is also educated" (Freire, 1997: 24).

According to Sun Alex (2011), public space can take different shapes and sizes, "from a sidewalk to the landscape seen from the window" (Sun, 2011: 19). It also includes places that have being designed for daily use, such as streets, squares and parks. The denomination of the public characteristic for these open spaces goes beyond the idea of freedom and equality. As stated by Sun, a direct relation of space with public life must be constructed. This relationship allows the presence in and use of same place by everyone, reinforcing the concepts of citizenship and democracy.

Backed by the ideas and concepts described above, the ARQUICRIANÇA[2] university extension project was conducted in 2015 by the Centro Universitário Belas Artes in São Paulo with architecture and urban planning students and the local community. The project was carried out using site analysis methodology and the local context for the development of a more attractive and inclusive public space. The cases of the "Dom Orione" Square and "Major Freire" Square are further discussed, as in both revitalization projects the co-participation method has been applied.

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[2] Coordinated by Professor. Débora Sanches and Sérgio Lessa Ortiz, MSc, and with the participation of the following students: Aryane Moutinho Diaz, Barbara Menezes Sousa Barreto, Carlos Alberto Borsa, Eder Junior Meza Monterroza, Gabriel Rocha Espinosa, Isabela Pires Viegas, Victoria Mazzoni Bistulfi.

THE CASE OF DOM ORIONE SQUARE

This square is located in the district of Bela Vista, a neighbourhood adjacent to São Paulo's city centre. Bela Vista has an estimated population of 23,951 inhabitants, of which 2,647 (11.05%) were children between zero and nine years old (IBGE; 2010). The neighbourhood is popularly known as "Bixiga", the region where Italian immigrants settled in the late nineteenth century. Land management is determined by mixed use, with traditional Italian restaurants and bars, theatres and cultural equipment. Yet, it is also marked by an extreme social inequality. A large part of the population lives in tenements, board houses and substandard housing[3]. Another important aspect to highlight is the historical architectural values. The region presents large areas under preservation order by the municipality[4] and consequently, the area covered enjoys the status of special protection zone[5].

In this district there are children who suffer from the lack of adequate housing, of spaces for cultural activities and leisure (such as green areas, sports equipment and playgrounds). As stated by the Istanbul Declaration on Human Settlements (1996), adequate housing and its surroundings must meet the needs of early childhood[6], in the initial and critical period of children's lives - when they are more vulnerable. They should live in a healthy environment that meets their basic physical, social, cultural and psychological needs.

The State's inability to guarantee children's social welfare rights and especially provide for adequate housing for a large part of the population that bear high levels of social vulnerability[7] fostered many philanthropic entities to base in the neighbourhood, Novolhar Association[8] being one of them. It aims to contribute to the social inclusion of children, young people and families, especially those who live in slums and board houses in the Bixiga neighbourhood. Among their activities are supervising children during the period when they are not at school, by teachers who provide complementary education, and also recreational, cultural and leisure activities. On May 13, 2015, an event called "13 na treze" was held aiming to discuss the cultural life of the neighbourhood. Among other activities, the workshop "assembly of children" was organised with children (six to fifteen years old) supported by the

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[3] Tenements and boarding house are names given in Brazil, to rented (small size) rooms in a house. Each room serves as housing for a family, with common use of kitchen and bathroom. The term gained notoriety with the book "O Cortiço" by Aluízio de Azevedo (1890).

[4] COMPRESP - Conselho Municipal de Preservação do Patrimônio Histórico, Cultural e Ambiental da Cidade de São Paulo

[5] Zona Especial de Preservação e Cultura, Special Zone of Heritage Preservation and Culture.

[6] This covers the period of the first six (6) full years or 72 (seventy-two) months of the child's life, according to Law n. 13,257 of March 8, 2016, which defines public policies for early childhood.

[7] Social vulnerability is the condition of groups of individuals that are in the process of social exclusion, mainly related to economic factors. The main characteristics that reveal the state of social vulnerability are the precarious conditions of housing and sanitation, difficulties of subsistence, and absence of a family environment.

[8] Paulo Santiago is a journalist, video producer and social entrepreneur. He founded the Associação Novolhar in October 1998. This is an institution accredited by the Ministry of Education as a reference for innovation and creativity in basic education in Brazil, contributing to the social inclusion of children, youth, family and community. http://novolhar.org.br/.

Centro Janusz Korczak/ Nina Koral, Novolhar Association and the Lumiar School. The children discussed the improvements they would like to have in Dom Orione Square. The ARQUICRIANÇA Extension Project was invited to organize a workshop on the revitalization of the square. It is also worth mentioning that children living in the area use this public space to play, since there are no other premises in the neighbourhood for this and, in particular, because there are few open spaces for children and adolescents in their tenements.

A Co-Participation approach for Dom Orione Square

The main objective of the co-participation process is to give voice to the different social actors - students / teachers / community - who converge on the principles of Paulo Freire's teaching and also on the activities of the extension project to develop inclusive public spaces. In this section, we describe the steps of the co-participation process that were carried out at the workshop in November 2015 to revitalize Dom Orione Square.

Approaching the site

In this stage a ludic workshop was held with 20 children aged 6 to 15 years. They were guided by the educators of the Novolhar association and by the architecture and urban planning lecturers and students. The main objective was to include the children's expectations and views on this particular open space in the project, a goal achieved by involving them by posing the following questions: What do the children want of this public space? What do they think of it? What are their dreams? Their wishes? Additionally, we inquired their point of view about the existing problems of this space. The answers provided inputs to develop the project of Don Orione Square´s the revitalization.

Drawing their wishes

In the following stage, a design activity was carried out with the question "what would you like to have in this square?". In this activity the children and adolescents could express their ideas (Fig. 1), and the students were able to consider and interpret these drawings as containers of their ideas and expectations, including needs of playground equipment, facilities and space for sports, which enabled the creation of a programme for the revitalization of Dom Orione Square.

Co-design

From the site analysis developed with the children and adolescents, it was possible to verify with the community the use and appropriation of space in the different periods and even on different days of the week - especially on Sundays, when the traditional flea market with improvised tents is held. Information on legal zoning was collected, providing additional relevant data. Finally, other projects were visited in the neighbourhood. Sketches were prepared based on the information from the previous stages, mainly from the statements of children and adolescents.

Fig. 1: Drawing workshop in Dom Orione Square. Author: Sanches, 2015

This process continued with co-design sessions. A physical model of the site was prepared from the sketches, in order to understand the availability of spaces. At this stage, the activities were held at Associação Novolhar, establishing a second listening opportunity. In this activity, children and adolescents spatialized their expectations using modelling clay, used to extract their spatial understanding of the site (Fig. 2), a fundamental stage to provide knowledge to the necessary adjustments in the project. The workshop ended with a conceptual design based on the co-participation of children and adolescents in the Bixiga neighbourhood.

Fig. 2: Children working with the first project sketches and modelling clay. Author: Ortiz, 2015

Co-participation

In 2016, the revitalization process of Dom Orione Square continued with the involvement of students / teachers / community / institutions in the project development, the construction design, and the search for resources for the proposal that was presented to the community in the Social Assistance to the Family in Bela Vista – Bixiga's main district, in the Espaço de Cultura Bela Vista and also in the square itself, as shown in Fig. 3. In all those meetings, the children and adolescents gave their contributions to the project. Afterwards, the project and the process of co-participation were presented at the EMEF[9] Celso Leite Ribeiro Filho for teachers and educators of the public teaching system of São Paulo. From these interactions, the project went through a new phase of adjustments and completion.

Likewise, the project was presented to SP Urbanism, an office of the São Paulo municipality responsible for the allocation of resources and the development of projects to improve urban spaces and squares. Due to the change in municipal management in January 2017, the guidelines for public resources changed their focus and the intention to revitalise Dom Orione Square came to an end.

Fig. 3: Discussion and interaction about the revitalisation project of Dom Orione Square.
Author: Sanches, 2016

THE CASE OF MAJOR FREIRE SQUARE

Major Freire Square is located in the south-central region of São Paulo, in the district Saúde, which belongs to the Regional Council of Vila Marina. The region's dynamics is defined as a mixed-use occupation with 130,484 inhabitants, according to IBGE (2010), predominantly an upper-middle-class population. Despite being a

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[9] Municipal School of Elementary Education.

neighbourhood with distinctive characteristics and needs, when compared with the Bixiga neighbourhood, the Vila Mariana regional council presents low rates of green spaces (5.19 m²/inh.), which are much less than the 12 m²/inh recommended by the World Health Organization (WHO). In Bixiga, this rate is even worse, being only 1.38 m²/inh.

In 1974, the city's first subway line was inaugurated, connecting the northern and southern regions, which propelled an intense transformation process of the neigh-bourhood due to real estate speculation. The subway greatly improved urban mobility, providing an increase in urban infrastructure in the region. It is possible to note a considerable increase in the region's residential density, as well as in markets and services which provide the district Saúde with enough infrastructure for living and working. Along these lines, it is worth mentioning that, in consonance with the reality of many contemporary cities, São Paulo aims to improve the main large-scale public transports (Strategic Master Plan of 2014). The main objective is to tackle the issues related to urban mobility and the scarcity of public spaces. The municipality and the population drafted (2012-2016) guidelines to make the mobility of the city less dependent on cars, create more green spaces and attract more people to the suburbs by increasing public transportation, jobs and basic service offers amongst all regions.

The principles of São Paulo's Master Plan seek to improve the quality of life, especially concerning the condition of public spaces, are aligned with the university extension project ARQUICRIANÇA. Urban planner Amanda Burden (2014) points out, in her TED talk "How public spaces make cities work", the enormous impor-tance of open spaces to create opportunities for cities. She emphasizes that archi-tects, landscapers and town planners should be the responsible agents for the city's transformation. Since it is up to these professionals to strive for the common good, cities must take every opportunity to create good public spaces which promote pleasant moments for socialisation and well-being; making cities enchant people and invite them to use all spaces and potentials.

At the end of 2016, the non-governmental organization EU RESOLVO[10] sought the ARQUICRIANÇA Extension Project to develop a workshop for Major Freire Square. One of the aims of EU RESOLVO is to promote the transformation of the city, from a differentiated attitude of the population. Instead of remaining passively and wait for the public power to take actions, the NGO intends to encourage the population to play an active role in the transformation and maintenance of public spaces, conse-quently, promoting improvement in their own life quality. The NGO EU RESOLVO, in its first project called "Praça Parque" aimed to involve the residents and workers to get involved in solving local problems, and to re-appropriate open spaces without a proper use and maintenance, co-participating in the solution to urban problems.

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[10] https://www.euresolvo.org.br

The decision for the pilot project of "Praça Parque" was made considering the following premises: selection of an abandoned area with the potential to be transformed into a park, next to a large-scale mobility system, with both residential and commercial uses, in order to not only transform and impact locally but also to affect the whole metropolis. The Saúde district emerged as a promising area for these purposes. In this way, the "Praça Parque" project would develop a proposal for an open space with the population, making sports, cultural and leisure activities possible. The intention was to stimulate the working population in particular to use the park after work; offering an alternative, the city's mobility would be benefitted by the decrease in the rush hour traffic.

Co-Participation Method for Major Freire Square

The co-participation process was used in the workshop to prepare a proposal for the Major Freire Square. However, due to the characteristics of the intervention, the interaction with the community occurred in a different way. The activities carried out from April 2017 are described below.

Approaching the site

Initially, only the professors and students of the ARQUICRIANÇA extension project interacted with the park. Thus, the students could become familiar with the place, train their perception, and think about which changes should be made in the square. By understanding that the process of technological development is becoming more and more part of the professional reality of an architect, it is worth mentioning that since the first approach to the square by the students, digital technologies boosted the process. In that first moment, the students were able to better understand the square with a 3D model of the space. During the visit, however, some residents and homeless people who lived in the area began to interact with the students, sharing their dreams and expectations, and thus providing essential information to confirm or question the concerns of the NGO EU RESOLVO. This enabled the students to elaborate their firsts drafts more assertively.

Designing their wishes

The site visit enabled the students to perceive that the neighbourhood was not able to effectively meet either the demand of commercial building users, or the needs of the local residents, who had asked for a proposal that could meet the neighbourhood children's needs. Another concern was the homeless people who were living in the square, emphasizing the lack of a proper public policy focused in social services.

To promote greater participation by the workers, some technological items such as free wi-fi spots, solar-powered cellular recharging points in busy areas, and points of energy capitation by movement, would be implemented. In addition to these technological resources, there was a permanent and diversified programme, initially maintained by EU RESOLVO, with activities such as gymnastics and open-air dance classes, sports tournaments and cultural events related to music, cinema and

theatrical presentations in order to invite more people to the place. Regarding sustainability issues, the project also provided technologies for the rational use of natural resources related to energy, water and waste management. Thus, the proposal led to the implementation of a solar energy system, to the capture and use of rainwater for irrigation and cleaning, as well as to the installation of selective waste collection points, among other initiatives.

To contribute to saving water, the planting scheme prioritised species adapted to the climate and ecosystem. A site was proposed to establish a plant nursery, making the park autonomous in the production of the plants needed for the maintenance of the square, in case of climatic adversities and phytosanitary problems. The promotion of universal access has also been implemented in the project's digital model, to allow everyone to enjoy the proposed activities and places. Thus, fitness equipment and children's areas are inclusive, providing access for people with reduced mobility and those with special needs. In addition, the project included ramp access, guide tracks and braille identification for all spaces.

Co-design

The combination of the initial plans of EU RESOLVO with the insights and expectations drawn by the students on the site visit and the interaction with the residents enabled the preparation of the first sketches and digital models, proposing solutions to the demands identified. One of the most relevant conditions at this point was the maintenance of all existing trees, as depicted in Fig. 4.

Fig. 4: Proposal presented to residents and future users. Author: Ortiz, 2017.

It is worth noting that, at the first stage of conceptual design, the topographic survey and the location of all trees had not been provided to the group. This enabled the promoters to carry out a new activity with the community. The first step was organising a public consultation, in which the group shared its first ideas with the local

residents and visitors to ascertain if the demands were being fully met. The main additional demands were the inclusion of a community garden, an apiary and more spaces for children's recreation, as well as broadening and rethinking the location of the area for pets.

Co-participation

Another event was organised as an attempt to further engage the neighbourhood residents and it aimed to make it possible for this abandoned area to be transformed - turning it into a pleasant space for all. Students and lecturers advised by EU RESOLVO presented the concept design to the Municipality of Vila Mariana, in order to involve the public administration in the process – making use of the co-participation methodology to include everyone. Therefore, a second event on the site was organised to better understand and spatialise the proposal. Illustrations and drawings marking the spaces and walkways enabled everyone to gain the proper perception of the intentions of the sketches. In this event everyone went to the site and started drawing with lime all the spaces and walkways on the ground - as shown in Fig. 5. During this activity some adjustments could be made, in order not to remove any large tree. Also, through this activity, the bonds of trust between the residents and public administration could be strengthened. The expectation of turning the project into reality became a possibility.

Fig 5: Drawing the proposal on the ground with the local residents. Author: Ortiz, 2017

The workshop was concluded in April 2017, with the review of the concept design in a process of co-participation with residents of the Saúde neighbourhood. The NGO contacted a topography service provider, who, in partnership, made the necessary amendments to the databases available. This paved the way to start the design development phase, which was concluded with a preliminary budget in order to provide guidelines for the feasibility of the plan and to organise the construction documents. Currently, the NGO EU RESOLVO is checking how the project can be implemented. Through fundraising with donations from companies and volunteers, the NGO is just about to start the improvement work on the square, turning it into a new special open space to our city.

CONCLUSION

A university extension project is a fundamental activity in the students' training process, especially in architecture and urban planning in Brazil, since the country's Educational Policy is based on principles of interdisciplinary educational, cultural, scientific and political practices and on a strong link between teaching, research and extended learning. Extension projects offer the opportunity to work on real-life situations in the process of teaching and learning, to articulate an interactive peda-gogical practice, as well as to combine the local community's practical knowledge with academic technical assistance, as a possibility for architecture and urban planning students to act with and plan for society. Processes involving students, lecturers, the community, local entities and public authorities are fundamental for the development of projects on public spaces - above all, for the action / reflection / action strategy disseminated by pedagogue Paulo Freire. The methodology developed in both cases, involving approaching the site, defining expectations, co-designing and co-participation, has effects on the appropriation of the sites, as well as on all those involved.

Finally, the training of architects and urban planners, qualified and sensible to the real-life issues of the city, should incorporate methods of co-participation. In the future, they will be professionals who will work in the city. Additionally, the application of this method can result in a reflection about new public policies for the development and maintenance of public spaces.

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Use and appropriation as the everyday design of public spaces in the Bexiga neighbourhood (São Paulo)

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Abstract – *Bexiga is a historic and popular neighbourhood in São Paulo, situated between the 'old' city centre and the well-known banking district of Avenida Paulista. The public spaces in Bexiga thrive, despite disinvestment and lack of formal urban design initiatives. While some authors attest an ongoing dereliction of duty by the city administration towards this traditional neighbourhood, others celebrate the relative preservation of Bexiga's architectural and cultural heritage. It is between neglect and resistance as social spaces that Bexiga's public spaces are shaped. This chapter explores the collective nature of everyday use and its role not only as creator of the neighbourhood's public spaces but also as designer of these spaces, albeit in latent form, through processes of use and appropriation. This rather informal character is addressed from the perspective of historical-critical research on the collective construction and evolution of Bexiga's public spaces. Such informality provides juxtapositions of past and present, as well as of change and continuity. Led by an empirical field research, this chapter analyses the construction of public space through use and appropriation. Findings reveal that the informal character of public space implies a more fluid spatiality and relies significantly on its temporality and its collective character. The dynamics of everyday design is the result of a range of organised and impromptu actions, in such a way that an organised event can endure unexpected uses in the surrounding areas, embodying a fluid public space. There is an underlying logic in the location of these spaces, close to housing and cultural hubs. It is the persistent everyday repetition of ephemeral acts of use and appropriation that creates and designs vibrant living public spaces in the neighbourhood. This creation plays an important role in the cultural preservation of Bexiga, acting as a reinforcement of its collective origins and character.*

Keywords - **Everyday use, everyday design, co-creation, Bexiga, São Paulo**

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INTRODUCTION

The widespread, yet local, urban dynamics of investment and disinvestment in central areas changes not only actors but also the identity of public open spaces. Processes of urban redevelopment and change have an impact on once consolidated public spaces as often oppose the generation of profit to social development and sustainability. The spatial fix (Harvey, 2013) of urbanization and capital have an impact on the social construction of urban spaces, subordinating the collective construction of public spaces to the exchange value of land. As proposed by Smith (1996), systemic disinvestment in central areas is part of a bigger process, in which the devaluation of certain areas opens the way to profit through a subsequent cycle of investments in a process of urban valuation. Either investment and valuation or disinvestment and devaluation can have a significant impact on the everyday construction of public spaces, as it affects the presence of social actors. Despite being decisive, these dynamics are often overlooked and, as consequence, compromise a fuller contextual understanding of many factors that might curb or encourage the collective construction of public spaces.

Amidst the not always welcoming scenario to public life in conditions of urban abandonment, insurgency experiences take advantage of public space devaluation to reclaim such areas through collective organization, resulting in the (re) appropriation of once degraded public spaces, like "a Batata precisa de você" [Batata – a square – needs you] and other movements in São Paulo. Grassroots initiatives have the power to challenge established relations between urbanization, capitalism and social dynamics. Public spaces emerge as a pivot in this process, as they enable the materialization of collective construction and defy the given logic of public investment allocation. Areas not prioritised by public investment can be taken over by collective action.

The central area of the city of São Paulo has been affected by disinvestment in a similar process as described by Smith (1996) in cities across Europe and USA. In this Brazilian case, disinvestment started in the 1950s, by a shift of investments towards other more affluent areas like Avenida Paulista (Frúgoli, 2000). This investment shift leaves areas equipped with infrastructure behind and, in São Paulo, devaluation allowed the settlement of underprivileged strata of the population in its central area. The concentration of employment and infrastructure combined with the relative lack of interest of affluent groups shaped a diverse and complex city centre. The combination of relative neglect and thriving public spaces characterizes the Bexiga neighbourhood, between the 'old' city centre and the well-known Avenida Paulista. Between these two poles and their urban dynamics (Fig. 1), Bexiga has always been an in-between space, taking advantage of its central location but never in the spotlight of investment or development. This aspect has shaped the current configuration of the neighbourhood and has contributed to understanding the factors that might

encourage or curb the collective construction of its vivid public spaces. While some authors attest an ongoing dereliction of duty by the city administration towards this traditional neighbourhood, others celebrate the relative preservation of Bexiga's architectural and cultural heritage. Between physical neglect and thriving public life and collective culture, we approach Bexiga's public spaces going from this larger contextual frame to reach the smaller scale of the everyday construction and design of public spaces. The morphological contrast between the surrounding neighbourhoods follows a different daily process of public life construction that responds to everyday needs, and challenges the established urban dynamics as it takes advantage of the given adversities.
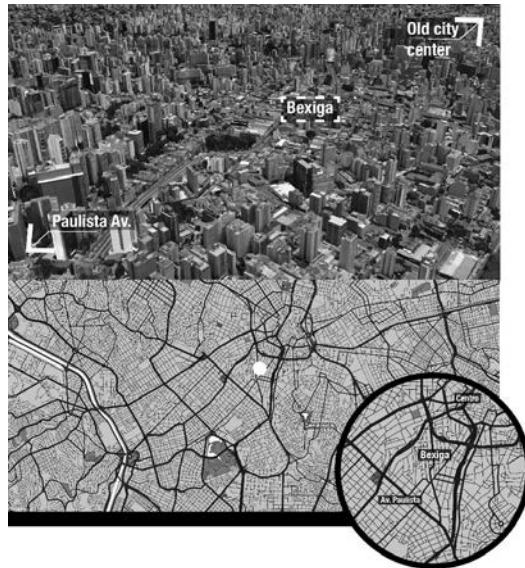

Fig. 1. The location of the Bexiga neighbourhood and its urban configuration.
Source: elaborated by the authors using Google Earth satellite image.

THE DIMENSIONS OF EVERYDAY USE OF PUBLIC SPACE

Many are the possible theoretical relations between everyday use and public spaces. In order to report them and structure the analysis to fit our purposes, we start with everyday use as conceptualized by Certeau (2008). This implies pushing the boundaries of this term beyond its usual temporal meaning, opening it to all possibilities covered by cultural fabrication. Certeau recognises the manipulation of what is given in a certain situation as bricolage, as everyday production of meaning. By valuing the active role of the consumer in manipulating what is given, people are emancipated from consumers to producers. This shift towards an active role is made through processes of use and appropriation, as the user manipulates the subject in its own way and will, often against pre-established rules which would supposedly dictate this process. According to the author, there is a hidden secondary production

on processes of use and appropriation. These practices have an underlying logic, this art of making and manipulating is guided by a hidden logic manifested in public culture. Through such lens, the everyday creation of public space can hinder discipline and order, and, instead, expresses the result of this collective logic of creation. In order to investigate such creation process, we rely on another concept from Certeau: tactics. As opposed to strategies, tactics is based on time, on the opportunity to make the best of the situation in order to get something out of it. It plays with events to generate results. Tactics are decisions, ways to better deal with the situation. Another dimension of everyday use is repetition. On a different but also suitable approach, according to Highmore (2002), Lefebvre understands everyday life as recurrence, commodity and oppression, yet also recognising everyday as the holder of a potential to promote changes in the existing exploitative relations.

In this way, we hereby construct a theoretical framework for the analysis based on everyday use as proposed by Certeau and Lefebvre. Although certain aspects are contradictory, the combination of the political dimensions of Lefebvre's everyday life with the emancipatory content of everyday creativity and production provided by Certeau, allows the investigation and interpretation of Bexiga's public space in a broader scale while also providing the basis for a small scale analysis of the practices and appropriation that shape these public spaces. While Certeau provides us with a closer look at the practices and the underlying spatial logic, Lefebvre's view contributes to a realistic look into the often exploitative sphere of the reproduction/exploitation that guides urban dynamics and might lead to insurgent appropriations of the public space.

METHODS

The exploration of everyday use and its collective nature as the creator and designer of the public open spaces of the Bexiga neighbourhood through processes of use and appropriation is articulated by qualitative and ethnographic strategies. Following the theoretical framework regarding everyday use as a concept through the lens of Certeau and Lefebvre, the analysis starts by a historical-critical review of Bexiga's public spaces, their collective construction and evolution as social spaces. This involves understanding the ways the neighbourhood's cultural identity and population constructed these spaces through history, in order to enable a more grounded contextual analysis of the current co-creation of the spaces. In this part of the analysis, we focus on informality as the connector that juxtaposes past and present use and appropriation forms. The current construction of the public space through use and appropriation is analysed using empirical field research. In an ethnographical approach, we conducted passive observation of some of Bexiga's public spaces during organised and non-organised events, occasion used for casual talks with users and inhabitants. The analysis is based on data collected during weekdays, weekends, and holidays.

SOURCES OF INFORMALITY

The unusual urban configuration of the Bexiga neighbourhood is a product of its history, which by extension results from the context of its urban consolidation and expansion. Considering the physical space and social fabric that together creates and consolidates public spaces through time, we explore a constant characteristic of the neighbourhood related to its public life: Informality, which has been a constant due to immigrants and the diverse nature of their backgrounds. Before the formal division of land into urban plots, this area, back in the nineteenth century in the outskirts of the city centre, sheltered the quilombos, gatherings of freed and escaped slaves. These informal settlements served as hiding places around the Saracura river, used for everyday chores back then. It is not a coincidence that this area was later the birthplace of São Paulo's samba music, and that until today it has remained a place of resistance of the black community. The samba school Vai-Vai was founded here in 1930 and throughout the year still attracts a great number of people to the streets during its rehearsals for the carnival parade. With the rapid urban growth processes that hit São Paulo at the end of the nineteenth century, the area was incorporated in the formal urban fabric of the city. The booming real estate market found no problem selling properties to newly arrived Italian immigrants, who are responsible for the Italian-inspired architecture typical of the neighbourhood. Together, Italian immigrants and the black community found their ways and constructed a neighbourhood in rather informal manners, against city regulations that value social order and are directed to the more affluent neighbourhoods. Between Italian shops and samba, social diversity fostered a persistent and vivid public life that has lingered until today.

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One of the main sources of informality are the cortiços, rundown collective tenements inhabited by the poor people often in unhealthy conditions. The cortiços in the central area are related to the lack of more affordable formal modalities of housing in the context of rapid population growth in the nineteenth century. Since then, urban legislation aims to curb the proliferation of such cortiços due to unhealthy conditions, but the municipality fails to meet the demand for affordable housing in central areas, closer to job opportunities and basic infrastructures. Despite all the insecurities resulting from the informal relations between landlords and tenants in the cortiços, for many families they are still the only temporary solution.

The social diversity that fosters the processes of creation of public space in the neighbourhood has been supported to this day by the residents of the cortiços. First, cortiços sheltered part of the black community when Italian immigrants and their descendants became the landlords, renting the basements for collective lodging. Starting in the 1960s, when the devaluation processes hit the neighbourhood, pushing the more affluent Italian immigrants to wealthier neighbourhoods, the conditions of the cortiços, now ran by other people than the Italian immigrants,

deteriorated. Around the 1970s, Bexiga was the most densely populated neighbourhood of São Paulo (Scarlato, 1995). This can be explained by the proliferation of *cortiços* (Fig 1). The verticalization process in the city centre swept through Bexiga towards Avenida Paulista, sparing some of the small-scale Italian houses from demolition. However, many of these houses had to make room for widening the streets in their transformation into avenues, which added to Bexiga's abandonment and devaluation.

As portrayed by Marzola (1979), progress seems to have forgotten the neighbourhood. Despite the relative abandonment, the collective organisation is a key factor that contributes to the thriving of Bexiga's public spaces. There are several organised groups and non-governmental organizations that work towards the collective construction of a more inclusive neighbourhood, like the Association Novolhar, active for more than 20 years. A collective action also planted the seed for the long process of formal recognition and protection of the architectural value of the built environment. Bexiga is the neighbourhood with the highest number of buildings classified by the Historical Heritage Office, which draws attention to its touristic potential. Social life is part of Bexiga's collective identity, present in oral stories and in publications about the neighbourhood's history. Being places for listening to live samba music and for religious Catholic and African festivities, the public spaces have an important historical dimension, with overlapping past and present uses. The persistence of an everyday informality somehow links the past processes of construction of the neighbourhood with the current everyday creation of its public spaces.

DESIGN BY USE AND APPROPRIATION

The co-creation of public space in the Bexiga neighbourhood based on use and appropriation is composed by a range of tactics that seeks to provoke changes in the given situation and in the shape of the environment to make the best of the situation. Informality is the feature that contributes to the overflow of the past historical creation of public spaces, through the cortiços and the cultural hubs that articulate organized events, such as religious street festivities, and impromptu spatial everyday practices. Based on the theoretical framework of everyday use, we aim to relate and spatialize these pulverized practices to a certain hidden logic of co-creation processes in the analysed public spaces.

The events organised by the community, in general, cause more intense use around a core area, but give rise to spontaneous uses in its surrounding areas, resulting in a sort of fluid public space around a centrality (Fig. 2). In the case of the most traditional festivity, the Festa da Nossa Senhora da Achiropita, the centrality is more linear since it takes place in the streets (13 de Maio, São Vicente, and Luiz Barreto Streets), attracting around 250,000 visitors per year. This big event takes place yearly on every weekend of a particular month, usually August. There are tents selling

typical Italian and regional food and live music. This event temporarily changes the neighbourhood's everyday routine as it mixes local inhabitants with visitors, brought together to celebrate the collective yet profitable culture of Bexiga. The surrounding streets to the centre of the festivity attract a lot of people heading to it. Many of them decide to remain in these secondary streets and sit on the sidewalks to create the desired atmosphere among acquaintances and enjoy the best of both worlds: avoid the crowded, loud space in the core, but still take pleasure in the street life and chatting with friends.
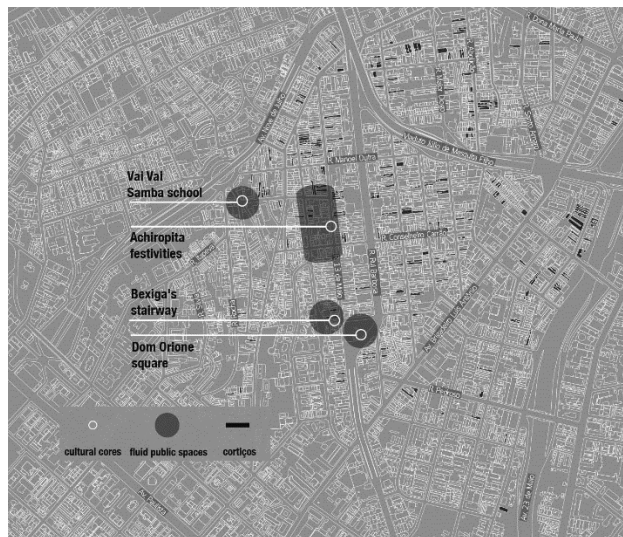

Fig. 2: Map locating cultural cores and the fluid public spaces around them the cortiço's locations.

On a smaller scale, the Escadaria do Jazz is another organised event. It takes place on Saturdays at the Steps of Bexiga, an important public stairway connecting the upper and lower parts of the neighbourhood, the historically richer and poorer quarters. As perhaps the best known area in Bexiga, the stairway attracts many tourists and, as a symbolic and cultural place, many organised events take place here, like the annual washing of the steps promoted by the African religions in memory of the abolition of slavery. As a more frequent event, the Escadaria do Jazz gathers a smaller number of visitors to listen to live music, eat and drink. As with the Festa da Nossa Senhora da Achiropita, there is a core area with more intense use and secondary areas adjacent to it. In both events, people use the given structures to create informal sitting or standing areas (Fig. 3). The high concentration of people in the former event forces visitors to stand around and lean on the walls and facades, while in the latter, visitors seem to stand or sit anywhere, according to their excitement to the music or choice to engage in conversation. There are no formal sitting places like benches; this seems to create an open invitation to a free appro-priation of the environment according to needs, i.e. sitting on the lawn around the

stairway, on the steps, or on the surface between the lawn and steps. Temporality is an important factor of these tactics, as the momentum plays a key role in the decision of where to sit. For instance, during the first minutes or hours of the Escadaria do Jazz event, the momentary small number of visitors might be intimidating, and people choose to lean on the walls and watch from a distance until more people arrive. When more visitors gather, people move from the periphery to the centre. During our observations, the first people to arrive tend to choose the steps to sit, but after someone jumps the lawn protection to sit on the grass, a lot of people follow, filling it instead of the steps. In this case, someone's small breach seems to encourage other people to do the same. This again highlights appropriation as a tactic that responds to the momentary possibilities and gives shape to this creation process.

Fig. 3: Some acts of use and appropriation in the neighbourhood.

The different possibilities of use and appropriation of the stairway contrast with the static benches and pathways in the adjacent Dom Orione Square. During the events, and even on a daily basis, the square has not been as frequently used by the population as it could be, as observed in the fieldwork. Most users tend to ignore the ill-located benches and sit on the kerb that separates the green spaces from the pathways and prevents people from stepping on the plants. The square is linked through view relationships from the stairway to the busy 13 de Maio Street. Even when formal sitting space is provided, people create their own space according to their will, maybe due to the static and restricted position of benches. While the organised events foster and actually lead to acts of use and appropriation, and as a result, to the creation of public spaces, the morphology of the built environment seems to play this role for the non-organised, more spontaneous and momentary creation of public spaces on a daily basis. The features of the traditional buildings, with flats on the first floor and a small shop or workshop on the ground floor with large doors and direct contact with the street, stimulates public life. People gather around these shops, which offer direct contact between in and out, private and public, contributing to a busy, thriving street life. During the fieldwork, in most cases

there were more people sitting on the sidewalks and leaning on the building facades than just passing by.

Sitting or standing also plays a decisive role in the everyday creation of public spaces, being largely responsible for public life. Beside the shops on the ground floor, the cortiços also impose the use of public space due to the reduced number of private spaces available to its inhabitants, which results in the overflow of otherwise private time activities into the public spaces. This evident overflow of informality, even of pitiable origins, stimulates public life and the establishment of collective relations between neighbours and small business owners. Many inhabitants spend some time on the sidewalk, getting in and out of the houses. These relations are evident in the small talks taking place in front of cortiços and shops, as well as in the passageways between such places.

This everyday co-creation of public spaces starting from people's needs ends up nourishing public life and promoting contact with other people. The dimension that overflows the public spaces is based on the collective identity of the neighbourhood, and it is frequently portrayed in samba music and in oral narratives. Clotheslines hanging in the facades was a frequent element in old photographs of Bexiga and they are still present nowadays. The culture of "will do", the appropriation of space to overcome adversities and fulfil needs is evident in our analysis of the uses and appropriation of public spaces. Overcoming everyday individual adversities is also related to a similar but more collective and organised process of use and appropriation which involves claiming the neighbourhood's underused structures and spaces. Exploring the situation inherent to everyday life in the neighbourhood not only highlights the wasted, misused morphologies and spaces, but also brings to the fore potential creativity and opportunities. The claim process surpasses the hostile character of the residual spaces under viaducts and organises an active fight for more quality public spaces. Symbolically, these wasted spaces represent an affront to the lack of space in the cortiços, or at least contrasts to them. To name a few (Fig. 4), the underparts of the Júlio de Mesquita Filho viaduct recently received the renovation improvements of Arena Bela Vista, a soccer field that hosts a social project which targets poor children teaching them to play soccer. The collective initiative emerged in the local community and was funded by the city council. Another part of the same viaduct hosts a Sacolão, a place for selling vegetables and fruits at reasonable prices. Another Sacolão is located under the Armando Puglisi viaduct, near Bexiga's stairway. Despite not being essentially public spaces, these spaces are sustained by and encourage social life in the neighbouring streets.

The everyday co-creation of public space can act as igniter of the claim of other public spaces, as is the case of the movement in favour of a park in Bexiga, in one the last few big empty plots in central São Paulo. The movement defines itself as a "cosmopolitical movement which fights for the creation of the Parque das Terras do Bexiga". Despite an existing draft law that foresees the establishment of the park,
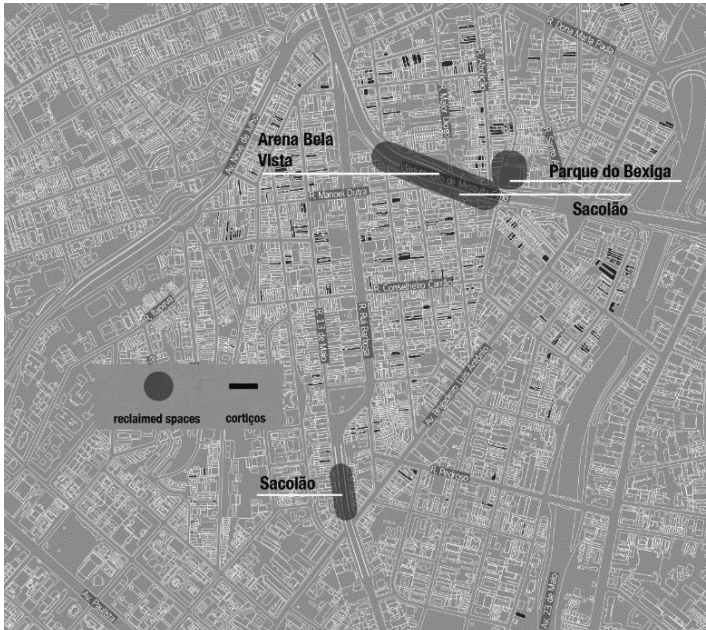
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Fig. 4: Claimed hostile and underused spaces towards collective use.

Fig. 5: Public display of support for the establishment of the public park in Bexiga.

the plot owner plans to build instead high-rise commercial and hotel towers, tearing apart the traditional human scale of building in this area. There have been organised protests to protect the area, transforming it into a collective, green space. The findings of our research suggest that the creative and engaging potential of the public sphere provided by the existing flexible public spaces also fosters the claiming of other public spaces, like the 'Bexiga Park' movement. Social mobilisation and collective action challenge the social dynamics that favour capital and private profit. The exercised everyday public life and the well-used albeit scarce public spaces in Bexiga are public evidences of the needs regarding public and green spaces. Mobilisation reinforces collective identity by encouraging people to engage in such common causes (Fig. 5).

CONCLUSION

The spatiality of Bexiga's public spaces and everyday temporality presents itself to the eye first as a rather curious entanglement between its population and the materiality of its territory. Further analysis reveals that the co-creation of Bexiga's public spaces transits between the ephemerality of everyday social acts of use and appropriation and its cumulative, insistent and repetitive urban qualities materialised in its public spaces. The apparent fragility of everyday scenes that shapes these spaces is replaced by a range of overlapping everyday uses. Our approach to the dynamics of everyday design suggested public space as the product of a range of organised and sponta-neous actions, in such a way that an organised event can experience non-organised uses in the surrounding areas, materializing a fluid public space. Such fluid space might encourage more practices of use and appropriation in order to fulfil the momentary users' needs. The tactics that create and shape Bexiga's public spaces seem to be the result of a range of acts of use and appropriation to manipulate the given space to make, firstly, public life feasible and, secondly, feasible according to the users' will. This rather emancipatory view, based on the theoretical framework provided by Certeau (2008), guided the exploration of the vivacity of the public spaces among the often hard urban reality of Bexiga.

The cortiços, those rundown collective tenements inhabited by poor people in unhealthy conditions, remain and contribute to the social diversity that enhances the co-creation process of the public spaces, becoming vivid places despite the hard conditions of inequality and disinvestment. There is an underlying logic indicated in the location of these spaces, close to housing and cultural hubs. It is the persistent everyday repetition of ephemeral acts of use and appropriation that creates and designs vivid public spaces in the neighbourhood. Such co-creation plays an important role in the cultural preservation of Bexiga, reinforcing its collective origins and identity.

Finally, we suggest that the process of urban abandonment and misuse resulting from the urban dynamics of investment and disinvestment, despite its well explored negative social and urban effects, can ignite processes of resistance and collective

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action for community demands. They are examples of unusual processes of use and appropriation that challenge the established urban dynamics; they not only have a local impact, but also, in a bigger symbolic sense, are acts of insurgency and collective transformation. This makes co-creation of public spaces possible in the first place. In this way, the everyday use and its collective design of public spaces acquire a bigger, rebellious dimension that feeds the hope of advancing towards urban change and may pave the way for the citizens' right to the city.

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Producing collaborative public space
- The Laboratory of Intervention in Architecture in situ / experiment

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Abstract - *This chapter discusses the role of collaborative practices for the production of public spaces. The growing complexity of urban contexts, due to changes in the production model and in urban activities is a challenge for scholars, technicians and residents. In this context collaborative practices have been a common approach in urban interventions in the last decades. The text presents eight editions of the project Laboratory of Intervention in Architecture in situ/, from 2012 to 2018. It is a project of intervention in local public spaces with the partnerships of the Municipality of Almada and numerous local institutions, using collaborative practices as methodological approach. In situ/ is also a learning process, as it is coordinated by a research centre, and has a strong concern with the educational aspects of these living labs and with urban research. Different research themes have been addressed – such as informal neighbourhoods, old industrial areas or coastal environmental protection – but they all have a common ground: how can communities (be they academic, local or institutional) contribute to solve territorial problems in transitional urban contexts using public space as a mediation and negotiation tool? In situ/ projects aim to promote innovative teaching and learning experiences outside the academic context, in multidisciplinary and diverse social and cultural contexts, but also to investigate issues of the city in transition and intervene in real contexts of action, promoting diversified partnerships with local entities, designing and building solutions to the challenges of contemporary metropolitan contexts, thus contributing to improve the quality of life of the populations. Along the same lines, this chapter aims to present the laboratories' methodological approach, focusing on the organizational aspects, the importance of all the actors involved and of the learning experience.*

Keywords - Collaborative practices, architecture, communities of practice, in situ

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INTRODUCTION

The increasing complexity of urban systems, especially the ones marked by economic or functional crisis – such as the decline of industrial areas or the persistence of slums – together with the increasing globalization of knowledge, are the source of a lively debate about the city as a socially produced and constantly changing space. Territorial problems in transitional urban contexts have been addressed, in the last decades, not only by academics (Lefebvre, 1968, 1986; Ledrut, 1980; Soja, 2010), but also by approaches that place the emphasis on the process and not on the final product, calling for collaborative methodologies that assume that citizens can play an active role in defining and transforming the space in which they live (Healey, 1997 and 2003). Many of these interventions are concentrated on the public space, which has been the center of an intensive debate, focused on its importance for communities' identity reinforcement, but also as a place for negotiation, between citizens and authorities (Delgado, 2011), often debating the contradictions between identity narratives and formal normative (Carmona, 2015).

Interventions in several territories have multiplied in recent decades, especially those of exclusion or resulting from processes of loss of urban vitality (for example in UN-HABITAT, 2010). Many of these actions tend to be a collective response to public policies concerning public space, often criticized for their top-down approaches (Carmona, 2015). However, given the diversity of spaces and contexts, these interventions tend to emphasize the particularities of each experience, with some difficulties in objectifying and systematizing concepts and practices. At the same time that terms like "participation" and "collaboration" are trivialized, the underlying question remains regarding a clear definition of the boundaries and scope of these concepts (Ramalhete, Gato, 2016). As such, and in the context of this text, it is relevant to introduce the concept of "community of practice" and explore its definition and scope. This concept was first used by the anthropologist Jean Lave and the computer scientist Etienne Wenger in 1991, in the book "Situated Learning: Legitimate Peripheral Participation" defending that communities are situated social learning systems. The conceptual and empirical framework for this notion has been developed since then, and a more recent definition for it is: "Communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavor: a tribe learning to survive, a band of artists seeking new forms of expression, a group of engineers working on similar problems, a clique of pupils defining their identity in the school, a network of surgeons exploring new techniques, a gathering of first-time managers helping each other cope."[1] (Wenger-Trayner, 2015). Concerning in situ/ this concept is especially relevant, since it is centred on the process of learning and on the construction of something that results from a collaborative learning process, where the final construction is much more than the sum of the parts of each one enrolled.

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[1] More information and texts of the authors at http://wenger-trayner.com/introduction-to-communities-of-practice/

In the case of architectural intervention projects, the term "community" has been used in projects that are essentially defined as being interventions of proximity, with a greater or lesser degree of interaction with local agents, with an almost indiscriminate appropriation of the term. In a relationship of close complementarity with the term "community", there is also the term "agency", since the logic behind these projects is based on the premise that actors have the capacity to intervene in the socio-cultural structure, promoting active involvement. Recently, the term spatial agency, created in the scope of a research project at the University of Sheffield[2] (Awan, Schneider, Till, 2011), emphasized the transforming capacity of architecture as a discipline of action in addition to the design and production of buildings (Schneider, Till, 2009). The project analysed and gave visibility to intervention initiatives by architects from several urban communities, many of whom inspired by the approaches of participatory interventions in the public space, derived from the perspective of sustainable planning of proximity and collaboration, based on the principle and theory of subsidiarity of the 1990s (Águas, 2012; Aguilera, 2004, Remesar, 2003; Borja, Muxi, 2003). In many of these projects public space is assumed as a transactional space, of social transformation and integration, and the produced objects themselves are considered producers of a transforming agency (Gato, Ramalhete, Vicente, 2016; Gell, 1998). In many circumstances, actions are taken aside formal land-use plans, although not necessary against them and become a matter of thought for future public space policies. In these cases, public space is also an experimental, learning space, with the negotiable capability of testing spatial hypothesis that may be, afterwards, consistently adopted as solutions.

This chapter has two main goals: i) to contribute to the debate on the role of collaborative communitarian projects as proposals to discuss the territories' futures. The text advocates that projects such as in situ/ are valid methodologies to analyse and test transitional or temporary uses for territories under discussion; ii) to discuss the importance of collaborative processes such as in situ/ as learning experiences. Since in situ/ is an academic project, based on students' participation, which contributes to a collaborative process with local agents, creating communities of practice, it is important to show that the final conclusion results from a collaborative learning process.

IN SITU/ LABORATORIES: METHODOLOGY

This chapter describes a case study of a laboratorial experiment regarding public space interventions in complex and transitory urban contexts. The project described places strong emphasis on the collaborative nature of the process, which includes co-creation with a large range of participants (inhabitants, local organizations, municipality staff and politicians, students, researchers, professionals, policy makers).

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[2] http://spatialagency.net/

In situ/ assumes itself as a project which has been able to create collaborative communities of practice, as methodological approach.

The Laboratories of Intervention in Architecture in situ/ are research/action projects that aim to promote innovative teaching and learning experiences outside the academic context, by investigating problems of the city in transition and intervening in real contexts of action.

Since 2012, eight editions have been held, all in the municipality of Almada, Portugal. The first edition was held in Terras da Costa, as part of a research project on that neighbourhood[3]. Following this edition, a partnership was established with the Department of Urban Planning of the Municipality of Almada (CMA). In the following editions, the intervention sites were selected together with the CMA team, always keeping, as selection criterion, spaces with intervention needs or in the process of transition without defined new uses, either in short-term interventions, or in terms of territorial management instruments. In fact, sometimes the existing or under development instruments do not address the issues raised by the territories - due to either the slow planning processes or the inadequacy of their proposals to the socio-economic reality of recent years. As a result, laboratories in situ/ always seek to propose reflections and transition solutions, providing and opening possibilities and immediate uses, regardless of interventions that may be made in the future. Throughout the various editions, a methodology of approach and intervention was designed, which is systematized next. All the editions promoted diversified partnerships with local entities, contributing to improve not only the spaces themselves, but also the populations' quality of life.

With regard to working methodologies, CEACT has maintained an organization team of three people (two architects, one anthropologist) throughout the various in situ/ editions, but each one has, as a rule, one or more teams of invited tutoring architects. The criteria for invitation are young architects, with experience in design and construction, and with works whose quality and interest meet the challenges proposed in each edition. The Laboratories are prepared six months to one year in advance, in articulation with the tutoring team, establishing also the necessary partnerships, site visits, meetings and contacts with the team from the CMA and other local partners. It is also during this period that possible programs for the intervention site and the building materials to be used are discussed and defined (through CMA support, direct procurement or sponsorship). Albeit with some differences among the various editions, the laboratories are usually performed within a period of about two weeks, comprising a design moment and a construction time. These are very intense experiences, for tutors and participants alike. The construction dynamics and the materials used vary, but this is an essentially collaborative process, with the participation of students, volunteers, residents, tutors, as well as technical and operational staff from the CMA.

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[3] Project Fronteiras Urbanas (FCT PTDC/CPE-CED/119695/2010).

Although the outcomes are always different, it is important to highlight the following aspects: 1) the experimental side of these learning / teaching experiences, which include a place for research and experimentation, but also for error; 2) the goal is not to build perennial structures, but rather to think of the territory and to build possibilities, sometimes transitory (which, of course, does not imply compromising the quality of the project or constructions); 3) in situ/ is not presented to the partners as a "participant" or "community" project, but as an experience with a limited duration of collaborative work. In fact, the creation of a "community of practice" is fostered, in which diverse actors (students, tutors, and associations, population, technical and operational from the municipality...) gather and work on a common project for a common space, based on operational cohesion and a methodological approach that has been developed and adapted over the years; 4) all the initiatives were held in public or common spaces, assuming that these have a transformation potential and are the place for promoting the discussion about the future role of those territories.

In all eight editions, around 350 participants were involved, in addition to partners, speakers (as there are always conferences during the laboratory), residents, members of the organization and tutors. As indicated, each in situ/ edition has presented different challenges. However, they have all posed contemporary urban problems to the tutors and participants. This diversity was intentional, since, from the academic, pedagogical and laboratorial point of view, it is important not to focus on just one reality. On the other hand, the reduced temporality of the in situ/ does not allow, admittedly, definitive solutions. The challenge is precisely to open possibilities, to design and to construct hypotheses for spaces that are, in fact, challenges for which there are not always immediate solutions.

These aspects may be considered limitations to the scope and durability of the interventions. However, the fact that the methodology has been coherent over eight editions has made it possible to go beyond these limits in several dimensions: e.g., it has been possible to identify logical communication among the various actors (organization, municipality, associations, participants, residents), some already present for several editions. This corresponds to a continuous process of mediation among the various agents, but the overall goals of the Laboratories ensure continuity, thus crea-ting a common culture, reinforced with each edition by the continuity of the project.

One interesting aspect is that the objects built are always a trigger for new spatial dynamics that start during the construction process, with the interaction between the participants and area's dwellers or passers-by. There is also a strong emphasis on the experimental side of each edition. Not only from the constructive point of view, since the participants are trying construction solutions that can be built with their own hands and available means (limited time, limited materials, limited skills), but also because each project experiments a solution for the problems raised by each territory.

The goal of all the laboratories is to build some kind of structures in public areas. These structures are a product of the whole collaborative process, from logistic preparation and territory analysis to the final construction. Nevertheless, the items built are proposals for temporary uses or hypotheses for future solutions, rather than definite solutions. The final design is not only a synthesis made by students and tutors of all the contributions and data gathered, with the participation of all the local actors, but a product of a learning experience as well.

IN SITU / LABORATORIES: AN OVERVIEW

All the Laboratories have taken place in Almada, and (except for the 2013 and 2014 ones) in other places, addressing different challenges[4]. One of the main objectives of the first editions was to think about urban contexts of informal genesis (*Noutra Costa – Terras da Costa da Caparica*, in 2012, InSitu e INSITUaction, in Torrão 2, Trafaria - 2013 and 2014). In the first edition, which had six teams of tutors[5], the exercise was mainly theoretical and speculative, focusing on the need to solve - in the short or medium term - the precarious living conditions of the *Terras da Costa* neighbourhood following an approach starting from the analysis of common space as a common ground for solving housing problems. The only construction was an artistic installation built in one afternoon by Likearchitects. From this exercise (Fig. I), however, new dynamics emerged, which led, for example, to the later construction of a communal kitchen (Ateliermob + Warehouse).

Fig. I: Noutra Costa: ateliermob proposal for a common initiative for future projects.
Source: Author, 2012.

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[4] For the in situ/ website, see http://insitu.autonoma.pt/. For a short video, go to https://www.youtube.com/watch?v=0lmDWmjCR34&feature=youtu.be. For a deeper analysis see Ramalhete et al (2020).

[5] Argot, Atelierbase, Ateliermob, José Castro Caldas + Sérgio Silva, Likearchitects, OTO.

As a result of the partnership established during *Noutra Costa*, the coordination and the CMA[6] teams proposed a different challenge for the following year: to think and build structures to support the population of the Torrão 2 neighbourhood. In Torrão 2, the Laboratory addressed some of the basic problems of the neighbourhood's public space (insufficient collection of waste, lack of safe spaces for children to play, lack of public facilities, degradation of the space of the residents' association). The teams of tutors[7] worked with the students and with the collaboration of the residents, to design and test solutions for these problems, such as the construction of garbage collection points, a children's playground, structures to support local vegetable gardens, the renovation of the residents' association building, and the construction of an outdoor table in a public space (Fig. 2), with the purpose of qualifying the places where children and youngsters met.

Fig. 2: Building a communitarian table at Torrão 2. Photo: Likearchitects, 2013.

Due to the social and urban complexity of Torrão 2, is was decided to continue working in the same territory in 2014, with the goal of improving, on a more permanent basis, two of the spaces worked in the previous year. The playground was rebuilt (Fig. 3), and an outdoor gymnasium plus a public space with shade were created[8]. Regarding these first three laboratories (Ramalhete; Silva, 2014) it is important to emphasize the significant interaction with the population and a growing participation by the CMA, as well as the fact that, in parallel or as a consequence of *in situ/*, several interventions in the neighbourhood's public spaces have taken place since then, either by private initiative or by local associations.

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[6] Filipa Ramalhete, Pedro Campos Costa, Sérgio Silva (CEACT), Alexandra Paio and Bárbara Varela (Vitruvius FabLab, ISCTE/IUL), Paulo Pardelha, Ricardo Carneiro and Amélia Pardal (CMA) – 2013 edition; José Castro Caldas (CEACT) was added in the 2014 edition.

[7] The teams of tutors were A+ LBY architects, Argot + 1/2atelier, Atelierbase, Ateliermob and Likearchitects.

[8] Miguel Marcelino and João Boto Caeiro + Rita Sarzedas were the tutors in 2013.

Fig. 3: Improving the playground at Torrão 2. Photo: Miguel Marcelino, 2014.

After the previous experiences of working in open public spaces, with strong interaction with the local community, the 2015 edition embraced a distinct challenge: to work in close partnership with two local associations on the theme of heritage rehabilitation. The APPACDM (Portuguese Parents and Friends Association of Citizens with Mental Disability) owns a farm in Pêra, Caparica, where there is a traditional noria the well of which needed repair (Fig. 4). With the collaboration with the Almada Archaeological Centre and the sponsorship of a local[9] company,

Fig. 4: Learning how to restore a noria with traditional whitewash techniques. Photo: Author, 2015.

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[9] The coordination of this and the following editions is managed by Filipa Ramalhete, José Castro Caldas and Sérgio Silva. The Centre of Archaeology of Almada has been a partner in the editions after 2015.

Fradical, it was possible to carry out this work, using traditional materials and techniques. Through the Laboratory[10] some improved structures of the exterior spaces were constructed (Ramalhete; Silva, 2016; ArchDaily Brasil, 2016). In this edition, the interaction between the participants and the users and residents of this Association was particularly interesting, as a very stimulating and participated discussion took place regarding the use of open-air common spaces.

The following year was a particulate intense one, since two in situ/ laboratories took place, both of which as a result of challenges that were launched to CEACT/UAL. In February 2016, INSITU'5[11] resulted from a challenge launched by the CMA, which was designed to construct blocks (mobile objects that could form barriers in places banned from visiting) and a support structure to visit the facilities of the Trafaria Prison, with the aim of converting that former prison into an area for cultural activities (Baratto, 2017). The structure that was built has provided support for several temporary exhibitions. The constraints in terms of deadlines and weather conditions were the main challenges of this edition. Coordinating resources and the knowledge of all the partners involved, however, allowed us to achieve quite satisfactory results (Fig. 5).

Fig. 5: Building visitation structures in Trafaria Prison. Photo: Author, 2016.

A second project was started in 2016, scheduled for two years, responding to a need already identified in previous editions. Following an invitation from the 2017 Greenfest festival organisers to design and build a space for meetings and conferences, it was decided, in partnership with the CMA, to begin designing a public space in a derelict

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[10] Tutored by João Quintela + Tim Simon, Victor Beiramar Diniz and José Castro Caldas.

[11] Gonçalo Pacheco, José Castro Caldas, Sérgio Silva were the tutors of this edition, held with the direct participation of CMA technicians and operatives.

industrial area, the Caramujo-Romeira. Work was developed in that space[12], beginning by evaluating the problems and potential of the space, while the (temporary) structure was designed to be placed for the Greenfest. At the location, an urban intervention was made using graffiti, which paved the way for this year's edition. Held in 2017[13], following the topic planned the previous year about vacated industrial spaces and their transitions of possible uses, a proposal for a public space was prepared and implemented, creating a structure that aimed to open new possibilities of usage for that place (Fig. 6).

Fig. 6: Creating new public space in Caramujo-Romeira. Photo: Author, 2017.

Finally, the 2017 *in situ!* edition responded to an invitation from a local association (EDA – Ensaios e Diálogos) to collaborate with the project TransforMar, for the coastal protection of Cova do Vapor beach. Adjacent to an informal neighbourhood, established in the confluence of the river Tagus with the Atlantic Ocean, this beach suffers from severe erosion, due to considerable human pressure, aggravated by the fact that it's located in a natural high-risk area. Based on the analyses made by local partnerships and tutors[14], *in situ!* built several wood structures to help protecting the dunes from erosion (Fig. 7).

This description concludes the summary of the first eight editions of *in situ!*. It is important to stress that, due to the limited time and financial resources of these projects, it hasn't been possible to make a parallel process of evaluation, to know in

[12] Under the tutoring of Rita Aguiar Rodrigues and Joana Pestana.

[13] Under the tutoring of ForStudio.

[14] Girão Lima Arquitectos and Eduardo Conceição.

Fig. 7: Protecting the dunes at Cova do Vapor. Photo: Author, 2018.

depth the strategies and the benefits, direct or indirect, of each edition. Nevertheless, an internal evaluation is done after each edition and, since some years have passed already, some results are visible.

DISCUSSION AND CONCLUSIONS

In the past decades public space has been one of the most studied topics for the disciplines concerned with spatial studies, such as sociology, anthropology or urbanism. Regardless of each author's academic, political or ideological approach, there is a broad consensus that public space is not a tabula rasa, but rather a social product (Lefebvre, 1986; Ledrut, 1980). The project presented here, the *in situ/* laboratories, follows the approaches defended by authors such as Delgado (2011) and Soja (2010), assuming that public space is where social negotiation takes place, since it is also where conflicts emerge and where social and spatial transformation is claimed. In this sense, in situ/ was conceived as a space where there is room for thought, experimentation, and mediation between all actors, having as basic premise that the role of each actor is relevant to the construction of the final objects. In this context, it is interesting to notice that the final results are more than the sum of the parts, reflecting processes of mediation, learning, negotiation and collaboration among all the players, thus accepting the assumptions of space agency (Schneider, Till, 2009), since it has been observed, after each edition, that the intervened spaces and constructed objects have in themselves a transforming capacity (it is relevant that none of the objects has been destroyed or vandalized).

Although the territorial contexts and the results were different in each edition, it is important to highlight two aspects: 1) the laboratorial aspect - since *in situ/* is part of an academic learning experience, research is essential, but participants also have

the opportunity to build what they conceive, and there is also margin for error; 2) the goal is not to build perennial structures, but rather to think about the territory and to build possibilities, sometimes transitory (which, of course, does not imply compromising the quality of the project or constructions), for what the places can be.

As stated above, in all eight editions of in situ/, around 300 participants were involved, in addition to the partners, speakers, residents, members of the organization and tutors. The goals of all laboratories have been fully achieved, not only from the point of view of academic learning goals, but also from the viewpoint of the intervention/ construction and mediation with the partners involved in each edition, providing participants with a social and architectural experience. By building solutions with their own hands, students gain a material perception of space, and also discover the need for mediation processes.

As discussed, each in situ/ edition has presented different challenges. However, they all posed contemporary urban problems to the tutors and participants. This diversity was intentional, since, from the academic, pedagogical and laboratorial point of view, it is important not to focus on just one reality. On the other hand, the reduced temporality of in situ/ does not allow, admittedly, definitive solutions. The challenge is precisely to open possibilities, to design and to construct hypotheses for spaces that are, in fact, challenges for which there are not always immediate solutions.

The fact that the methodological approach of in situ/ has remained coherent over eight editions has made it possible to identify a logical communication among the various actors (organization, municipality, associations, participants, residents), some already present for several editions. This corresponds to a continuous process of mediation among the various agents, some of whom remain (like the CMA team) while others are always different (e.g. tutors); still, the overall goals of the Laboratories ensure continuity, creating a culture common to all issues. This common culture, reinforced with each edition by the continuity of the project, is aimed at creating communities of practice that have guaranteed the success of each Laboratory. Moreover, one aspect that has been interesting is that laboratories help to strengthen communication between people living in these territories and public institutions, contributing to a better understanding of the mutual realities and building new perceptions about the intervened territories. Finally, another finding relates to the impacts: in the short term, the Laboratories have a very positive impact on those who worked directly on the design and construction. But it has also been seen that the interventions already been carried out, even the most perennial, have a very reasonable durability and seem "to make waves", sparking debates on the territories and originating subsequent projects, with or without a direct relation with in situ/. In the case of Torrão 2, for example, the residents continued the constructions beyond the schedule of the Laboratory.

In situ/ laboratories combine a practical, workshop, dimension with a research one. The eight editions held until 2019 have tested and proven the value of applying the described methodology with consistency over the years. Another relevant contribution from these experiences is that collaborative processes are an interesting and proactive way to discuss and test the future of territories in transition or in deprivation. Also, as learning and teaching experiences, in situ/ laboratories are quite innovative, as they operate in real contexts, solving real problems. Finally, reference should be made to the contribution that these initiatives can represent to the discussion of future models of collaborative planning, not only in contexts of urban continuity, but also in contexts of crisis and uncertainty. These can be debates on the future uses of territories in transition, where these projects could be a way of opening up the discussion about the possibilities that each territory holds to all local agents.

The experiments presented have, nevertheless, some limitations. The short temporality of the laboratories implies very intensive work, which does not leave much room for gathering fieldwork data and systematic observation. And, although there is an informal evaluation and follow-up after the laboratories, a systematic evaluation has not been made yet, thus hindering a deeper theoretical and conceptual analysis. In the future, it would also be extremely interesting to promote research on these projects made by other researchers, coming from different knowledge areas. This has happened, on a limited basis, to some of the laboratories, but not to the process as a whole.

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Categorisation of digital tools for co-creation of public open spaces. Key aspects and possibilities

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Abstract - *Information and communication technologies (ICT) have the potential to contribute to the quality and attractiveness of public open spaces and to promote their inclusiveness through a co-creating approach, when ICT tools are used with consideration. There are many different digital tools available and all the time new ones are being developed. However, there is no scholarly consensus on which types of ICT tools are best to use in a specific stage of the co-creation process to effectively support the spatial planning process. This chapter explores the literature and discusses technological and spatial quality as well as user-related aspects of different types of digital tools. Our objective is to define the basis to better understand the different potential of digital tools to meet the needs of people and be useful for all the parties involved in the co-creation process with the focus on planning and development aspects of the quality of public open places. The chapter addresses the challenges faced by urban planners and designers when they wish to integrate ICT into the process of planning and design and the complexity of the User – ICT – POS interlink. It also explains stating points for a categorization of digital tools for co-creation. Finally, it proposes a framework for classification of digital tools for co-creation. It also takes up the challenge of identifying the criteria for the assessment of existing ICT tools, their features, added values, suitability and usefulness at a particular stage of the public open space co-creation and development process, as well as paving the way for further analyses of their advantages and disadvantages in comparison to analogue tools.*

Keywords - Digital tools, co-creation, public open space, categorization of digital tools, urban planning

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INTRODUCTION

Alongside urbanisation, the development of ICT has been growing rapidly and penetrating all spheres of our lives. Cities and urban life are particularly affected by ICT growth, as modern urban lifestyles are fast paced, and so are ICT. They have made a strong impact not only on our social behaviour and experiences, but also on the ways we understand and interact with our living environment. The physical imprints of ICT can be seen everywhere. Telecommuting influences the way people and information move, using the installation of physical objects and infrastructure to enable digital functionality and digital screens to visualize it. Every day the use of personal ICT devices is changing the potentials and spirit of places as well as the needs of their users. Still, despite the fact that ICT pervade all functions in our urban environment, little attention has been paid to their current and potential role in the design and planning of our urban environment (Graham & Marvin, 2002; Houghton, 2010).

This is especially relevant for public open spaces (POS), which have been historically recognised as a testbed for new and changing needs of communities. Can, in this fast-paced present, new digital technologies act as a necessary medium to enable and support the development of speed-down places, places which are responsive and flexible, that enable new ways of interacting and connecting socially, and boast liveability? To what extent are urban designers and planners prepared for this new situation and challenges? Do they consider altered requirements of POS which technology might bring? And do they understand all the new possibilities ICT are bringing forward for co-creation processes and activities related to the planning and design of POS? Can they plan more responsive POS according to the advanced expectations and requirements of the digital age? Finally, do they perceive digital technologies as a part of the urban milieu, such as are people or buildings?

This chapter develops a contextual review of the link between different users of ICT and public spaces in the co-creation process to effectively support the spatial planning process. It focuses on the 'how' rather than on the 'who'. In this sense, identifying and discussing the characteristics of different user groups (stakeholders) involved in specific stages of co-creation process is not in the centre of examination. Instead, we focus on defining key attributes for selecting appropriate ICT tools and aim to elucidate how certain characteristics of ICT (tools) relate to its users and POS, and can, consequently, support POS and urban planning development. Hence, this chapter discusses theoretical background, focussing on current trends, as well as issues and possibilities of integrating ICT into planning. With the view to developing a framework for ICT tools classification for use in planning matters, we examine and discuss key aspects of the User – ICT - POS connection and meaning. Finally, to better understand and assess the potentials of digital tools to support co-creation activities and promote inclusiveness of public open places, we discuss the usability of categorizing digital tools.

ICT IN URBAN DEVELOPMENT

The emergence of the "Smart city"

Many cities around the world have already embraced different opportunities, offered by the rapid development of digital technologies. The concept of "Smart cities" has been widely implemented to manage urban assets and resources more efficiently. However, there have been several objections to its implementation, especially when smart city policies have not been integrated into the city's existing infrastructure. Roche et al. (2012) argue that smart cities rely too heavily on technological aspects, where mistakes are almost inevitable, but they do not take into account the human dimension: the role social capital could play in the transformation of cities, on one hand, and, on the other, of the needs and wishes of city dwellers. Indeed, developing cities that are more technically than human-oriented is questionable in achieving the long-term prosperity and liveability of the city. Furthermore, there are several other issues connected to the development of smart cities, such as the promotion of a technocratic approach to city planning and government when implementing technology becomes a goal, e.g. installing a high-tech climate management device into a building when planting a tree would solve the situation equally well (McSpadden, 2018). Further issues are, for example, hacks, which can be devastating if a city is built on a digital infrastructure, the surveillance state reliant on profiling, etc. Hence, embracing technology as a tool is fine, as long as other variables are also taken into consideration and not compromised. Roche et al. (2012) stress that this should happen from the very beginning with studying existing dynamics of urban contexts, city's spatial, social and other structures, with the aim of empowering urban communities to adequately meet the challenges which cities face. In their view, smart cities will be successful only when people integrate technologies into their daily lives; therefore, technologies should be taken as a beginning and not as the end of a process.

Technology builds mainly on data collected from citizens, which is processed and analysed to improve cities and in this way "benefit its inhabitants and business" (European Commission, n.d.). Because of this and other (advertised) goals of a smart city, the term has been used in policy pushing by many governments across the world, mainly stressing its obvious positives and not really questioned as a policy decision (McSpadden, 2018).

Due to the critiques, the concept has expanded into more people friendly areas, using digital technologies to support also innovative urban and infrastructure planning of cities and the interaction of citizens with authorities as well. It focuses more on the perception and use of urban environment, and the forming of social relationships and cultural identity. In other words, the reformed idea of a smart city is to use technology as a tool to improve the functions, services and wealth of the cities. The reviewed literature indicates that a good understanding of the link between people – technology – place is crucial to achieve the sustainable development of cities and their open spaces.

Penetration of ICT into urban life – Are ICTs a tool to impoverish or improve public spaces?

A considerable amount of literature recognizes that the emergence of ICT has had a negative impact on the use and perception of POS as well as on its quantity and quality, since ICTs have enabled a shift to virtual space for both work and recreation (Mitchell, 2005; Riether, 2011; Stadler, 2013). Meyrowitz (1986) and Stadler (2016), for example, discuss the rise of internet-based communities and the fall of location-based communities, since, in the era of the internet, it is easier to connect with people with common interests from the whole city than from the neighbourhood. Stadler (2016) also lists fun, entertainment and joy as some of the features most often lacking in POS but as being easily attainable through ICT (e.g. playing games on mobile devices), which strengthens people's dependency on ICT devices and weakens their relation to the physical part of the city. Furthermore, Riether (2011) considers that blogs and online forums have substituted discussions in physical spaces, and social networks have replaced face-to-face meeting, while Hatuka (cited in Badger, 2012) observes that wayfinding applications on mobile phones have almost completely eliminated communications between strangers in public open spaces.

On the other hand, a substantial move of digital technologies away from the desktop to mobile devices has allowed people to shift from the workplace to public open spaces. Wireless networks, in particular, have been recognised as effective tools to shift communication back to the public realm. Moreover, some scholars speculate that people are becoming tired of ICT and are trying to reconnect with reality and value immediate social interaction (Hatuka, cited in Badger, 2012; Houghton, 2014; Stadler, 2016; Ward Thompson, 2002). Public spaces are the major platform to facilitate this new stream and so they are valuable now and will be even more valuable in the future.

Taken together, it cannot be challenged that ICT are changing the historical value of POS to society (Hatuka, cited in Badger, 2012; Houghton, 2014). The above--mentioned studies provide important insights into the changing dynamics of public open spaces (POS) and point to the urge for creating better connections between digital space and physical public space in order to reactivate POS.

The CyberParks Project[1] is an instance where the topic was approached as a new phenomenon of comprehensive interactions of the nexus constituted by people, public open spaces and technology, addressing a wide range of challenges related to understanding and producing new types of outdoor use and place characteristics. It developed a new concept of urban space, a "cyberpark" where nature and ICT technologies interlink into a new type of mediated public space, offering new responsive places of hybrid experiences and new possibilities of use and interactions

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[1] COST Action TU1306: CyberParks – *Fostering knowledge about the relationship between Information and Communication Technologies and Public Spaces supported by strategies to improve their use and attractiveness.* www.cyberparks-project.eu.

with space and people, supporting new forms of engagement, communication and co-creation. In the CyberParks publication 'The Making of the Mediated Public Space' (Smaniotto Costa & Ioannidis, 2017) different authors discuss the possibilities of ICT tools to evoke and effectively support human activities towards inclusiveness and co-creation of place. The main focus of the CyberParks project is on enhancing the quality of life and space, as the lure of technology should not serve to create high-tech places but rather places that are inclusive and responsive. In a cyberpark, ICTs and their devices are a driving force, media and tool, which act as mediator between users and the virtual and real worlds. And that in turn could fuel people's greater attachment to places.

The C3Places Project, building on the outcomes of the CyberParks Project, aims at developing strategies and tools to increase the quality of POS through ICT by influencing co-creation and social cohesion effects positively. Within the context of the Project, this chapter discusses an introductory attempt to create a support for different stages and aspects of the planning process by structuring and highlighting the potential of different ICT tools. This involves presenting an overview of different aspects and key attributes of the link between people, places and technology. First, however, it is crucial to understand the possibilities of using ICT tools for urban planners and designers.

INTEGRATING ICT TOOLS INTO URBAN PLANNERS AND DESIGNERS' DEVELOPMENT OF PUBLIC SPACES

To understand the broad range of possibilities that the rapid and continued develop-ment of different types of ICT tools could provide urban planners and designers with for more successful and contemporary POS development, it is important to understand to what extent these professionals are already equipped with the knowledge and skills needed to deal with this issue, and what they still lack to achieve more efficient outcomes.

The call for a shift towards considering digital technologies in urban developmental matters was made several times in the early era of ICT. In the past, different scholars recognised both the potential of ICT and the need to integrate them in spatial planning and development. Ward Thompson (2002), for example, has forecast that digital technology will not simply replace POS; on the contrary, ICT may increase and enhance the use of POS. Ward Thompson (2002) also speculated that ICT will change POS to an extend that new forms of POS will emerge; however, this has not happened (yet) to any wider extend. Similarly, Mitchell (2005) in his book "Placing words, symbols, space, and the city" turned to urban planners to respond to the disconnection between the virtual and the physical spaces. On a broader scale, Graham & Marvin (2002) discussed the development of telecommunications in cities and highlighted the urgent need to develop new conceptual and analytical frame-works which would help policy-makers and researchers to better understand the challenges of ICT penetration in public open spaces and policy responses.

Almost a decade later, a diverse literature on innovation and ICT-related issues in cities continues to stress the limited discussion and implementation of new technologies in contemporary urban planning and design while reinforcing the opportunity of ICT to reframe how cities are organized and planned (see e.g. Dodgson & Gann, 2011; Houghton, Miller, & Foth, 2014). Among relatively few studies, carried out on this topic so far, it is worth mentioning a study by Houghton, Miller & Foth (2014), which examined the role of digital technologies in urban planning from the perspective of planners and designers. They held focus groups with planners from different backgrounds and found out that there was very little engagement of planners with the affordances of ICT in their professional practice, mainly due to insufficient knowledge and skill, agency and time constraints. The participants did, however, acknowledge ICT as an opportunity to connect with users of public open spaces, share information in and about the place with the public, and to foster faster adaptation of places.

The overview of different cases and examples of ICT use in the planning process (Falco & Kleinhans, 2019; Stadler, 2013; Šuklje Erjavec & Ruchinskaya, 2019) also shows that the use of digital tools by urban designers and planners is mostly limited to of the development of web platforms offering a more or less comprehensive set of digital tools to support different participatory activities. These are mostly related to data collection (e.g. about people's preferences, needs and activities, spatial problems requiring attention, etc.), information sharing and engagement experience (e.g. playing a game to build a city), but less in joint activities which would actively involve different actors in co-creating a public open space. Indeed, not urban planners and designers but artists seem to have been breaking new ground when it comes to experimentation with new formats of POS. Riether (2011), proposing a new prototype of public space by integrating art experiment into a space, sees art as a territory to explore new questions and experiment with new ideas. The author, too, calls for the need to rethink what incorporates urban planning to make room for a digital infrastructure. It appears that the responsiveness of spatial planning to challenges and opportunities opened by ICT tools is very slow in comparison to the extremely fast technological development. One important aspect in uncovering the reasons for this situation is the very different timeframe of changes characteristic for ICT development and urban planning and design practices. Whilst ICT development is fast, urban planning and design practices are complex and bound to social, political, cultural, spatial as well as natural development processes that are, except for natural disaster effects, usually very slow. This may explain the slow response of urban design, as professional practice, to the opportunities of new technologies and the emergence of better connections between digital and physical public open spaces.

Still, ICT offer interactive and innovative tools which can better connect people and places; therefore, it is important for urban planners and designers to acknowledge, understand and direct the interaction of physical and digital layers (Houghton et al.,

2014). In order to adequately explore the wide range of possibilities which different types of ICT tools can provide urban open space planners and designers with and to use ICT tools with consideration, understanding the characteristics of ICT tools and how these pertain to planning and design approach levels, processes, steps, connections and time flow may help urban planners and designers to use them with greater ease. A structured overview of the different aspects of ICT tools, to form selection criteria of appropriate ICT tools, may help planners and designers in their decision-making. Classification possibilities are discussed in the next section.

COMPLEXITY OF THE USER-ICT-PUBLIC SPACES NEXUS

Many of the contributions for the conceptual framework of this chapter derive from the outcomes of the COST Action project CyberParks. Within the CyberParks Project different working groups explored challenges to the User-POS-ICT relationship from different angles of various disciplines. Such a transdisciplinary approach enabled acknowledging the breadth of the topic and the development of diverse interesting frameworks. The baseline is structured according to the degree of users' engagement with the ICT used. It consists of four main categories of ICT-technologies: Augmented Reality, Localization Technology, Wireless Network and Vision Technology, plus three additional dimensions of ICT that were recognized as important: Human Behaviour toward ICT, Privacy and Security Assurance, and Environmental Development. All of them are illustrated with practical examples closely related to spatial quality, user needs, spatial attributes and added value of ICT for public spaces as depicted in Fig. 1 (Ioannidis & Smaniotto Costa, 2019).
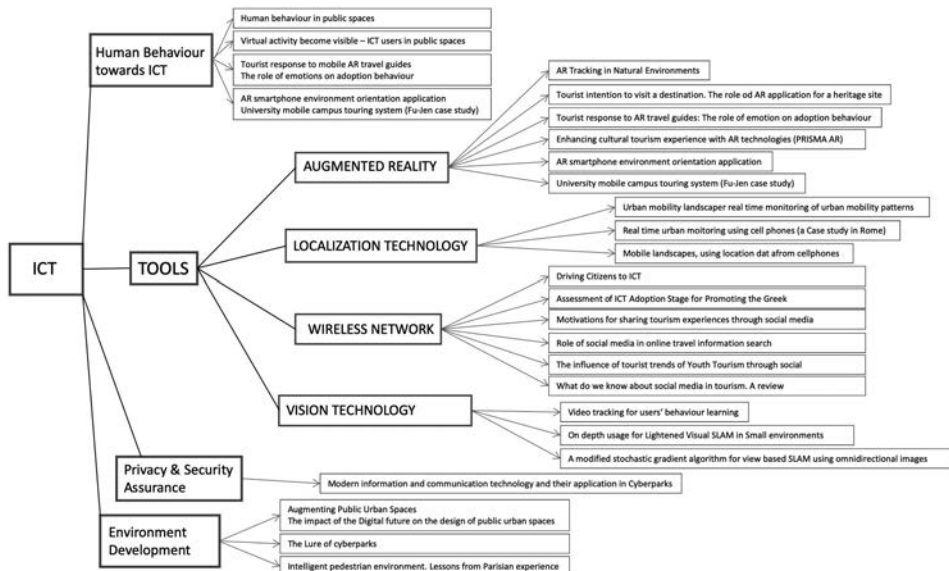
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Fig. 1. Understanding the diffusion of the digital into public spaces
(Ioannidis & Smaniotto Costa, 2019: 245)

The focus of CyberParks was on researching and defining the (possible) added value of applied technology for users and uses of places, how digital tools are affecting user-behaviours and users' spatial needs and how all this impacts the development, characteristics and quality of public open spaces. Five working groups explored relevant issues (digital tools and methods, urban ethnography, conceptual reflection on ICT, place and society, cyberpark design challenges and dissemination activities), investigated the shape and scope of ICT impacts and the opportunities digital technology creates to improve the liveability and inclusiveness of place as well as new forms of involving people into the urban design and development processes. In Working Group 4: Creating Cyberpark[2] which focussed on ICT impact on urban open space design issues, participants explored the possibilities of new uses and technologically mediated activities and spatial characteristics of a new type of POS – the *"cyberpark"*. To better present the new challenges, an overview table was prepared explaining what kind of provision and spatial attributes are needed for new hybrid space activities and "cyberspace use" (Table 1).

CYBERSPACE		OPEN URBAN SPACE
Cyberspace use	Hybrid space activities	Provision
Gaming / playing	Location-based play, playable city	Play devices, urban games that use (at least partly) the real space – tasks linked to special places of elements
Meeting and communication	Meet in space, not necessarily synchronous	Post office infrastructure/benches (read only within a perimeter)
Creating, artistic expression	Virtual graffiti, online sound and music Interaction with the user Co-creation of place	ICT functions embedded in furniture, trees, lamp posts, touch screen painting displays (uploadable and local chalking), post office infrastructure as part of the Internet of Things (IoT)
Learning and information	Gaining new knowledge, raising awareness, raising responsibility Helping to recognize the place, to orient, to read its functions Learning about the environment you are in at the moment and its history	Audio-visual displays – multifunctional elements, part of paving, walls, buildings… focusing the user's attention on particular elements Artistic interventions
Legibility – orientation	Navigation of both space and information	Way-marking, physical and conceptual structuring, GPS, etc.
Exercise, health, mental restoration	Group activity, individual activity	IoT, exercise infrastructure Support with measurement opportunities, competition possibilities, (bio-) monitoring for individual to be attracted to do exercise
Buying, acquiring material goods, sharing business opportunities	Delivery points, commons	IoT supporting pop-up markets, local trade, yard sales – in space we may provide suitable locations – urban design guidelines?

Table 1: Users activities technologically mediated
(prepared by Working Group 4 - Creating Cyberpark. CyberParks Project[3])

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[2] Ina Šuklje Erjavec was a vice-chair of the CyberParks Project and member of its Working Group 4 (http://cyberparks-project.eu/working-groups/4-creating-cyberpark).

[3] http://cyberparks-project.eu/working-groups/4-creating-cyberpark

Furthermore, possible benefits (added value) of the implementation of the three categories of applied technology (Position informatics, Sensory informatics, Synergetic interfaces) in public spaces for users and uses of places were listed as:

- Enhancement of publicness,
- Increase in the performance of public open spaces,
- Increase in the production and co-creation of public open spaces,
- Increase in the knowledge on users and on uses,
- Dissemination of information in/about the places,
- Use of ICT as a support and challenge for new outdoors activities.

These benefits also serve as basis for a response matrix that combines the typology of public spaces for the Pool of Examples of CyberParks, which aims to increase the understanding of the benefits of technology to enhance places in order to achieve added value (i.e. new outdoor experiences, innovative ways of using places) (Ioannidis & Smaniotto Costa, 2019). This approach was structured more in detail in a final overview table of Working Group 4 (Implication of Spatial Aspects). It presents the how and what kind of user needs can be addressed by providing and implementing ICT, what the added values are, how they relate to attributes of place and which aspects of spatial quality can be enhanced and improved upon (Table 2).

Spatial quality aspects	User needs	Attributes	Provision/ICT implementation	Added Values
(Public) Accessibility	Physical accessibility orientation, navigation, access for all (inclusiveness) Accessibility to technology – skills/use, affordability, equality (inclusiveness)	Easy to use (intuitive) devices, user-centred design (no need to be ICTliterate) Path quality (access for all) online information before visiting place - available for all needs	Wayfinding apps – clear information on physical qualities online, 'filtering' of needs based on user profile/requirements Overlaying of additional information within App for specific purposes (augmented reality); Insitu devices **LT, AR**	Enhancing access for all (facilitating it) and responding more specifically to user requirements, possibility for user feedback to enrich data
Security	Perception of safety in the space, not to be controlled or observed; to retain: - physical safety - emotional/ - psychological safety - Internet security - not to be hacked	Physical/virtual privacy, confidence, alertness to danger	ICT tools and apps for: Lighting Suitable structure of place, good visibility, Validated networks Sound and light interactivity Monitoring cameras **AR, LT, VT, W, DM**	Social networking – more present Higher usability New users New ways of lighting flexibility of activation system
Legibility	understanding of the place/ease of movement	Readability	Planning - Layout and way-marking **AR, LT, VT, W, DM**	Flow
	Clear Identity of place	Unique features	Artworks, landscaping, facilities	Recognition, significance
Sociability	Participation and inclusion Interaction	Gathering social spaces, play spaces	Clear space/ICT demarcation / timeindependent but spatially localised social interaction **AR, W, DM, LT**	Wellbeing and social cohesion, ownership/care sense of belonging, e-agora

Spatial quality aspects	User needs	Attributes	Provision/ICT implementation	Added Values
Adaptability	Capacity for change	Future-proof design Flexibility Ephemerality	Regular maintenance and updating **VT, DM**	Co-creation, citizen input, experimentation of solutions, possibly temporary
Functionality	Accessibility Comfort	Welcoming spaces, clear pathways	Social design and facility provision **DM, LT**	System trust
Connectability	Between spaces (permeability), people and information	Secure and highbandwidth provision	Maintaining networks, facilitation **W, DM**	Social cohesion, communication
Variety	Attractors Opportunity of choice	Gaming, social, information layers	Embedded games and play, socially hybrid spaces – e.g. chess/coffee **AR, LT, VT, W, DM**	Enjoyment, play, new users, innovation
(Social) resilience in the face of emergency	Collection and provision of effective and reliable information; Knowledge on where to go; Access to amenities Organisational support for groups	Quick responsiveness Spatial adaptability to user needs ICT-functioning support Accessibility (to both space and technology)	Energy independence or passive energy generation Monitoring devices e.g. air/water quality, waste… **W, DM, VT, LT**	Timely information provision and exchange A direct communication channel e.g. via social media Monitoring available resources
Environmental/ ecological sustainability	Optimal microclimate Water retention Biodiversity Pollution and natural disaster mitigation	Real-time monitoring via sensors Visualising the information in situ	Sensors Screens Apps **DM, VT, LT, in situ sensors**	Raising awareness and knowledge Support policy making and management
Health (physical and mental) and wellbeing	Outdoor physical activity Mental restoration (connection with nature) Knowledge on optimal environmental conditions to carry out physical activity	Challenging and attractive environment for physical activities; Virtual environment to enhance wellbeing; Real-time information; Health-related statistics	Innovative elements that invite one to perform physical activities Screens, Apps Games **AR, VT, LT, DM**	Raising awareness, knowledge, promotion of a healthy lifestyle. Attracting new people outdoors; Fostering visitors' activity; Offering new experiences

Table 2: Overview of the implications of spatial aspects. Source: Cyberparks – WG4 (adapted by Ina Šuklje Erjavec, UIRS)

STATING POINTS FOR CATEGORIZING DIGITAL TOOLS FOR CO-CREATION

The development of digital technologies opened new opportunities for different collaborative processes, many new possibilities to engage and activate people, and for new ways of interacting with the environment. However, to effectively use all the ICT potential it is important to understand co-creation in its broader sense: as a process that includes all stages of POS development and addresses all types of related collaboration activities, such as involving end users (citizens) and other relevant stakeholders, sharing information and local knowledge, collaborating on data gathering, expressing opinions, needs, wishes and values, defining priorities,

visions and aims, working on decision making as well as placemaking with different participatory planning and co-design activities and co-management (Šuklje Erjavec, 2017; Šuklje Erjavec & Ruchinskaya, 2019).

However, an overview of present classifications by various authors showed that there have been very few attempts to holistically examine and classify ICT tools according to their potential for integration into the planning process. One interesting study was made by Houghton, Miller & Foth (2014), who defined three main groups of ICT potentials for planners: Technology for analysis of place, Technology in place, and Technology for community engagement about place. The approach of understanding ICT tools from a comprehensive process of place development, i.e. planning and design, implementation, management and use, is very useful for further development of an ICT typology for needs of urban planners and designers, and to explain the possible added values and benefits of using ICT tools properly. As further next step towards better understanding the possibilities for co-creation, we developed the following structure of the possible use of different ICT tools. It explains the type of function and way of integration in the process of planning and design, place making, place management and community engagement.

For expertise work – technology for supporting spatial development processes
> in the **process** of spatial planning and design, digital tools could be used to better:

- Understand, analyse and evaluate spatial and social state of the art faster, more deeply and comprehensively
- Assess and evaluate proposals more transparently
- Develop more transparent solutions, scenarios and models
- Present solutions more understandably and efficiently for non-experts (hardware and software)
- Perform sharing, co-production, co-creating, co-designing between experts and with stakeholders

For place functioning – technology in place & technology supporting the use of place
> in the **process** of place making, digital tools could increase:

- Responsiveness and adaptability of place
- Communication about place and within place
- Orientation and access to information
- Attractiveness, usability and playfulness of place
- Identity and recognizability of place
- Personalization and individual creation possibilities
- Education possibilities,
- Research possibilities, etc.

> in the **process** of place management, digital tools could increase

- Monitoring – environmental and spatial quality
- Maintenance feedback (sensors, mobile apps, platform)
- Work coordination
- Traffic management
- Cultural content management
- Technical management
- Maintenance management
- Information management, etc.

For community engagement – technology for supporting community engagement
> to raise awareness and increase involvement of the community, digital tools could increase the effectiveness of:

- Information collection, sharing and management
- Social communication, interactivity and networking management
- Public involvement and participation
- Co-creation process management
- Construction of community capacity and common issues and goals

Within the scope of the C3Places Project, a methodological framework was developed to assess the case studies which have been implemented as C3Places Living Labs. The proposed framework is summarised in a Digital Co-Creation Index – a tool to assess, measure and compare digital co-creation initiatives. The index is compiled in three sub-indexes: POS quality Index, to evaluate physical and social aspects; Digital Inclusiveness Index, which explains the extent to which technology enables co-creation; and Social Responsiveness Index, which is linked to stakeholders and community members and addresses their maturity to respond to social challenges and generate public value (for further reading, see the chapter Assessing Digital Co-Creation in Urban Transformations: Case of Vilnius, by Skaržauskienė. On this basis, a conceptual framework was elaborated to convey the penetration of ICT into public spaces. The criteria are structured according to three aspects: spatial quality aspects, user-related aspects, and technological aspects (Fig. 2).
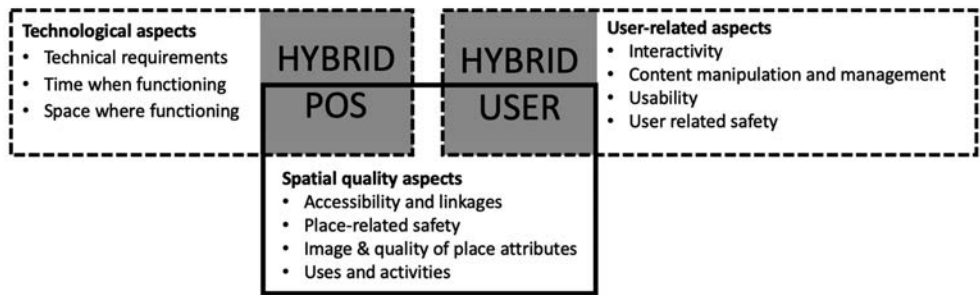

Fig. 2: Three aspects and criteria to consider when selecting ICT for co-creation of public spaces

Spatial quality aspects

The approach to evaluating these aspects is grounded on basic principles of researching, understanding and designing public spaces developed by theorists and practitioners such as W.H. Whyte, J. Gehl, S. Carr and others. Specifically, the criteria, indicators and tools from the Project for Public Spaces "The Place Diagram" (Project for Public Spaces, 2009) and Jan Gehl's "12 Urban Quality Criteria" (2017) were examined more profoundly. In addition, we took into consideration the outcomes of the CyberParks Project and evaluated the performance of the C3Places POS Quality Index (C3Places, 2019) for the Living Labs assessment that we adapted to the current context of POS, with its digital transformation in mind. The main spatial quality aspects which include additional dimensions relevant for ICT penetration into POS, are defined as:

- **Accessibility and linkages –** Legibility, Navigation, Convenience for movement, Interlinking, Level of physical, social and digital accessibility.
- **Place-related safety –** Vandalism, Traffic, Injuries, Environmental safety (monitoring).
- **Image & Quality of place attributes –** Attractiveness, Personalisation and individual creation possibilities, Adaptability, Monitoring, Environmental quality and Ecological sustainability.
- **Uses and activities –** Communication and education possibilities, Access to information, Sociability, Research possibilities, Playfulness, Variety, Responsiveness, Service provision, Health and wellbeing.

User-related aspects

To define criteria for these aspects, our guiding question was: Which characteristics of ICT are needed to satisfy use and successful co-creation experiences? As basis for development of criteria the Social Responsiveness Index and the Digital Inclusiveness Index were used, plus a sub-indices of Digital Co-Creation Index (C3Places, 2019) and literature review of existing classifications and criteria of ICT features to enable satisfactory user experience. We considered criteria for methods and approaches selection from "Participedia" (n.d.) and the work of Kaplan & Haenlein (2014), who focused on collaborative projects, such as one on ICT tools, grouping them along two dimensions: type of knowledge that is created within a collaborative project, and mutual independence of individual contributions. We define user related aspects as:

- **Interactivity –** User's engagement along with the device/ media/ application used, its type of interaction, degree of interaction and type of experience
- **Content manipulation and management –** How is it provided and what is user supply?
- **Usability –** Ease of use, respect for privacy, saving work for future use, customization potential, possibility of choice

- **User-related safety –** security and privacy assurance technology (protection of personal data, anonymity of ideas, etc.) and social resilience

Technological aspects

The guiding question for the technological aspects was: How can digital technology support quality of place and the way the place is used and developed? The main issues to define are:

- **Technical requirements regarding** software, hardware and network communication, and their installation: is there a need for the internet, are any specific operational systems required, i.e. electricity, speakers, etc.?
- **From the time-related point of view:** is the ICT tool functioning permanently or temporarily, continuously or intermittently?
- **From the point of view of functioning place:** is the ICT tool static, located in the POS, portable, to be used in POS, or remotely accessible to be used for distant POS-related activities?

On this basis, we have systemised types of ICT tools and their supporting devices in three main categories which describe where the tool is installed in relation to the open space and how an ICT tool interacts with the user. The subtypes of tools are defined according to POS, user-related functions and specific characteristics. Thus, the developed framework for classifying digital tools for co-creation is addressed in the next section.

FRAMEWORK FOR CLASSIFICATION OF DIGITAL TOOLS FOR CO-CREATION

Place-located ICT tools

These tools are located 'in place' and installed as part of the physical features of the POS. Such digital tools add new functions to existing places or are part of the design of new ones, combining digital and physical layers into a new, hybrid place. The overview of place-located ICT tools is presented in Table 3:

Type	Subtype
Individual digital elements as new types of elements of POS	Digital public displays
	Public interactive and pervasive displays
	Multimedia interactive elements
	Multifunctional tech totems
	Interactive and responsive sound installations
	Responsive lighting elements
	Multimedia pavilions
	Interactive POS elements: a combination of different digital elements (e.g. screens + speakers + lighting) as artistic installations per se or frames for them, responsive sculptures and fountains, play equipment, etc.
	Individual elements for energy provision, such as electric vehicle charging stations, solar energy stations, etc.

Type	Subtype
Digital part(s) of POS elements or parts of surrounding buildings and elements	Digital elements upgrading or supporting the functioning of urban elements (these are incorporated into traditional types of POS furniture like benches, tables, fences, lights, playing or sports equipment, etc.)
	Digital additions for upgrading the functioning, maintenance or experience of the area, like WI-FI hotspot, speakers, QR codes, sensors, beacons, universal intelligent nodes
	Elements for energy provision to support the use of portable ICT devices that are incorporated into traditional types of POS furniture, playing or sports equipment, etc.) in the shape of plugs, solar panels, etc.
	Media facades as part of other built structures, e.g. facades, walls, etc.
	Projection mapping (Digital projectors)
	Digital projectors as part of other built structures, e.g. facades, grounds, walls, etc.
	SAR (spatial augmented reality) systems: - Shader lamps (projector-based augmentation) - Mobile projectors - Virtual tables - Smart projectors (projection mapping), etc.
Responsive materials	Adaptive pavements (adapting to the weather, accessibility needs, etc.)
	Responsive verticals (changing by touch, sound, etc.)
	Measuring materials (for monitoring use, conditions, etc.)
	Self-cleaning, self-repairing materials

Table 3: Examples of Place-located ICT tools

Portable ICT tools

Portable ICT are digital tools that bring a user to the public open space and establish a relationship with space, other users and/or other premises. Their main purpose for POS development and co-creation is to develop new forms of uses and activities in the POS by extending human abilities, i.e. adding a digital sense to the five basic human senses and to support a direct feedback from users for better POS development and management. Their structure is presented in Table 4.

Type	Subtype
Smart devices	Smart phones and tablets
	Smart glasses (e.g. Google Glasses)
	Smart grid
	Smart watches (e.g. iWatch), etc.
Place-related mobile APPS	Directly supporting learning about place and its natural and manmade characteristics, adding to the experience of place, support moving through it, activity and movement tracking
	Collect and share data on environmental conditions, evaluate conditions, etc.
	Directly support place evaluation and feedback
	VR and AR apps for opinion and proposal development and sharing, etc.
	Other apps are discussed in the context of web platforms and apps (Table 3)
GPS-positioning devices	Individual or as part of other smart devices
Other personal VR and AR devices	Head-mounted displays (e.g. headsets, eyeglasses, contact lenses)
	Multi-projected environments
	Combination with physical environments or props (e.g. 3D mouse, wired glove, motion controllers, optical tracking sensors)

Type	Subtype
Cameras, recorders	Many different options
E-textiles – aesthetics and performance enhancing	Smart garments, smart clothing, smart textiles, or smart fabrics providing benefits to the wearer, enabling the interaction with the environment and responsiveness to personal activities and condition Wearable computing with microcontrollers, sensors and actuators
Digital health and fitness tools	Devices and apps to encourage healthy habits, fitness and other physical activity tracking, health measurements, Internet-connected fitness systems, environment quality sensors and alarm systems

Table 4: Examples of Portable ICT tools

Remotely accessible ICT tools

Although we also acknowledge in this group ICT tools such as laptops, PCs, screens, mobile phones and other hardware, a variety of these is broad and not directly relevant for the aims of this paper. Therefore, we focused only on web platforms and apps and a group of related tools used for digitally networked interactions, such as distant (not on the spot) society engagement, public consultation, information and opinion collection, exchange and sharing, voting, etc. Their general advantage is that they can at any time reach a much larger number of people who can also choose their own time of use.

In the structure we focus on aspects that are very important to support different co-creation activities for POS development, such as preparing, discovering, debating, deciding, designing, implementing, maintaining, using, and monitoring public open spaces. Table 5 provides a general overview of how different components and tools enable and support different dimensions of remote public involvement.

Type of components/ tools	Examples
Social networking platforms and sites	Pinterest, Facebook, Instagram
Static web sites	Professional portfolios, digital curriculums
Blogs and microblogs	WordPress, Joomla, Drupal, Twitter
Tools for social bookmarking, tagging	Pinboard
Online storage (cloud storage, file synchronisation, personal cloud)	Dropbox, GoogleDrive, iCloud
Social network aggregation	Hoot Suite, FriendFeed
Encyclopaedia	Wikipedia
Survey[4]	Google Forms, SurveyHero, Typeform, SurveyMonky, InvolveMe
Content communities - online databases of multimedia content that allow users to share online multimedia materials, i.e. photos, videos, podcasts, presentations, etc.	Flickr, SmugMug, Picasa, GigaPan Youtube, Vimeo iTunes SlideShare, VoiceThread

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[4] https://www.wordstream.com/blog/ws/2014/11/10/best-online-survey-tools

Type of components/ tools	Examples
Internet forum/ Message board Textboards and Imageboards	Quora, SkyscrapperCity
Chat rooms in the form of Web conferencing, Video conferencing, etc. **Instant messaging**	Facebook Messenger, Gmail messenger, WhatsApp
Electronic mailing list, news group	Mailing lists of different organisations, companies, institutions, etc.
Online dictionaries	Urban Dictionary

WEB GIS[5]
  - Analytical
  - Animated and real-time
  - Collaborative (e.g. PPGIS)
  - Online atlases, etc.
	Open Street Map, Google maps, Apple maps, and many different project-specific and city-specific data collection platforms

Web-based simulation platforms and apps for discrete events, continuous events, etc.	Digital participatory platforms: Mobility Testbed, Commonplace, coUrbanize, TransformCity, etc.
Construction and management simulation games, e.g. city building games	Lincity, SimCity, etc.
Augmented reality apps	Pokemon GO, ScentExplore
Virtual social worlds	Second life

Table 5: Examples of Remotely accessible ICT tools: Web platforms & apps

CONCLUSION

As discussed in this chapter, there is already a substantially wide recognition of possible benefits of incorporating digital tools in a development process to improve the quality and functioning of public open spaces, from the perspective of the contemporary user as well as POS developers and managers. However, until now, in the urban planning process and POS design, ICT tools have not been used to any significant extent due to various reasons, but predominantly due to urban planners' and designers' lack of understanding, knowledge, skill and time. To improve the understanding and recognition of various options for using ICT for POS development by urban planners and open space designers, we presented and discussed different aspects of digital tools and their potential to meet people's needs, attract new users and promote the inclusiveness of public open spaces, as well as effectively support the co-creation process for a better performance and use of POS through co-creation activities. Our aim was to explain and justify how different characteristics of digital tools could be useful for all the parties involved in the co-creation process. To this end, we have structured ICT tools into categories according to their area of use within the planning and functioning of POS, and pointed out their key attributes and aspects related to their potential use for all phases of POS development and functioning.

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[5] Wikipedia Web Mapping: https://en.wikipedia.org/wiki/Web_mapping

What is needed now is to set criteria for evaluating existing digital tools, their features, added value, as well as advantages and disadvantages in comparison to analogue tools, and align their characteristics with their usefulness for specific steps and phases of the co-creation processes. This is what we plan to explore in our further research within the C3Places Project.

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Modifying and co-creating the urban soundscape through digital technologies

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Abstract - *Sound is one of the most dynamic elements of the public open space in cities. The perception and understanding of this sonic environment by its users or society as a whole is commonly referred to as the soundscape. It depends on the noticeability of the composing sounds; the preference, expectations and beliefs of the users; and the overall context that is set by the visual environment and the envisaged use of the space. The local character and the volatility of the soundscape make it an ideal subject for co-creation involving citizens. Digital technologies are applicable for audiovisually predicting the impact of design options. Auralisation, either ab initio or based on multichannel recordings, still involves technological challenges that will be explored in this chapter. Digital technologies can also be used for adding sound accents that allow to change the character of the soundscape, e.g. making it livelier or increasing its mental restoration potential. Such digitally augmented soundscapes can be the direct result of a co-creation effort with the users of the public open space. The innovative combination of creating a tailored soundscape and the ability to achieve this through a co-creation process has a promising potential impact on the user experience in public open spaces.*

Keywords - Soundscape, co-creation, virtual reality, augmented space

AN INTRODUCTION TO URBAN SOUNDSCAPE

The urban public space contributes to the health and wellbeing of the inhabitants of growing and more densely populated urban areas (Björk et al. 2008). The urban public space is perceived and understood by its users through a combination of senses, yet while designing this space, visual aspects often remain the main and only point of concern. Sound, smell, micro-climate, etc. are more volatile components of the urban space that are strongly related to the use of the city. Yet they contribute to an important extent to the overall liveliness, pleasantness, and restorative character of the public space. They make it a place suitable for a specific use that contributes to the overall identity of the city (Rehan, 2016). This chapter focuses on the sound environment.

Perception of the urban sound environment

The sound environment as perceived and understood by the users of the public space within context – for which the term urban soundscape is now commonly used – is more relevant for urban public space design than the mere sound levels per se (Raimbault & Dubois, 2005). The main determinants of soundscape and its effects on urban dwellers are now well known (Kang et al., 2016). Sound perception is a process that could be described as the whole auditory scene analysis and its concurrent interpretation by the person. Environmental sound is a complex mixture of various sounds originating from different sources. In order to understand it, humans tend to dissolve this mixture into the individual auditory streams using auditory, but also visual as well as other cues (Bregman, 1994).

Environmental sounds can be regarded as any sound that does not have a communication value for the listener, as opposed to speech or other informational sounds. Therefore, initially, there is no particular strong attention focus on the environmental sound, and the person is listening in readiness. Consequently, most of the environmental sounds that humans are exposed to are therefore the ones that are not being regularly noticed but form a background mix or a hum. However, from these sounds the listener's attention selects and forms the auditory streams. Auditory attention is, at one hand, guided by the physical characteristics of the sound that contribute to its saliency, i.e. standing out of its background (Filipan et al., 2019). On the other hand, people also assign meaning to the sound and focus their attention based on their preferences for listening (Filipan et al., 2017).

Sounds that have positive connotation and consequential attention to them is something that would be considered as an improvement of the sonic environment. Accordingly, in the soundscape research, it was shown that by adding positively contextualized sounds, such as bird sound or the sound of water streams, the characteristics of the added sounds improve the overall appreciation of the sonic environment (De Coensel et al., 2011).

Categorization of urban soundscapes

From an urban planning point of view, the vision on the use of specific public spaces in the urban network determines the desired matching soundscape. For this, a categorization of soundscapes and classification of sounds (Brown et al., 2011) could be useful. In recent years, categorization of soundscape has often been related to the circumplex model of affect (Axelsson et al., 2010). This model distinguishes between several areas in a two-dimensional pleasantness-arousal plane. In between the main axes which are labelled pleasant-unpleasant and eventful-uneventful respectively interesting quadrants of soundscapes are identified that are labelled exciting, chaotic, monotonous, and calm. These areas could also be linked to the sounds that are dominantly heard in the public place. For example, the sound of people is often dominant in soundscapes that are labelled exciting, mechanical sounds are prominent in soundscapes that are labelled chaotic, and natural sounds are often dominant in soundscapes that are labelled calm. This approach and all experimental work using it assumes attentive listening.

However, as discussed above, the users do not commonly notice the sounds while using the public space. Hence a very common category of urban sound environments is simply backgrounded. These sounds are not expected to significantly contribute to the experience of the place. Thus, another categorization that focusses more strongly on the role of the soundscape in the overall perception of the urban public place was proposed (Fig. 1). This hierarchical categorization distinguishes between backgrounded and foregrounded, a property that is strongly related to the
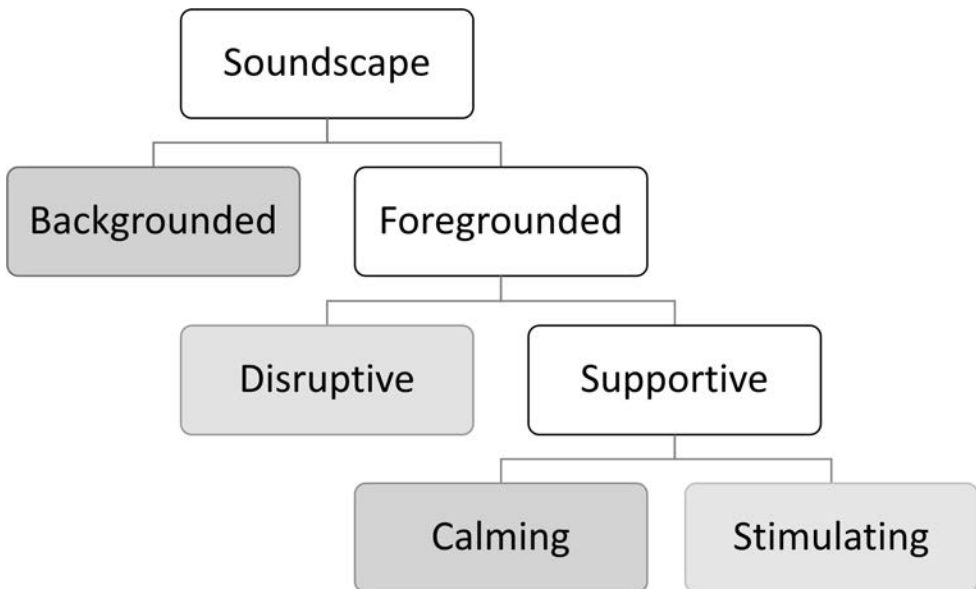
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Fig. 1: Categorization of urban soundscapes according to their contribution to the experience of the urban public place. Source: Authors.

degree to which the soundscape attracts attention, for example due to the salient components. Foregrounded soundscapes that prohibit the intended use of the place or at least disrupt it, are labelled disruptive while all others are rather supportive. Finally, supportive soundscapes can support the calming or the stimulating character of the public place. This last subdivision is clearly related to the exciting and calming areas in the affect model.

Opportunities for co-creation

Urban sound is often a by-product of activities: driving cars or public transport, cooling and heating of houses, enjoying pub-life, etc. As these sounds are often unwanted, several technologies and planning (Sanchez et al., 2018) could be applied to mitigate them. However, all of these come at an economic or social cost. As the use of the place, the context, and expectations of its users play an important role in how the sound environment is perceived and understood, the local inhabitants should typically be involved in deciding what measures are appropriate and require priority (Schulte-Fortkamp & Jordan, 2016). Co-creation therefore opens a wealth of opportunities to improve public spaces and their use. This co-creation should nevertheless avoid a few critical pitfalls. Firstly, when it comes to the technical side of mitigation lay people often lack the technical expertise to estimate the expected impact of noise control. For example, the difference in effectiveness of a green berm and a noise wall may be difficult to estimate (Van Renterghem and Botteldooren, 2012), or the effect of traffic signal synchronization on noise and air pollutant emission may be confused (De Coensel et al., 2012). Therefore, a training session for the people involved in co-creation may be needed (Botteldooren et al., 2018). In addition, urban sound experts predicting the impact of noise mitigation use indicators such as a yearly-averaged equivalent noise level, LAeq, that are difficult to interpret by the stakeholders participating in the co-creation process.

In recent years virtual and augmented reality (AR/VR) (Calabrese & Baresi, 2017; Fukuda et al., 2017) have been introduced to preview urban design and architecture both off site and on site. Unfortunately, the sonic environment is often not, or only with very poor ecological validity, included in the AR/VR environment. This technology nevertheless opens a unique opportunity to increase the level of understanding of urban sound design by the stakeholders in the co-creation process. This chapter will elaborate on these opportunities and remaining challenges.

But technology can lead to another, less expected, co-creation. Musicians have since the realm of cities collaborated in co-creating the soundscape of public places. Today, technology can extend this possibility with new ways of delivering sounds that augment the urban soundscape and by largely extending the range of sounds that can be used. In a passive way, loudspeakers providing sounds that are generally liked by users of the space, are added to benches (Schulte-Fortkamp & Jordan, 2016) or carefully integrated in the landscape (Licitra et al., 2010). Users of the public place

are usually participating in the design process of the sound compositions. But co-creation could go one step further allowing users of the space to augment the space with their own designs. Musikiosk (Steele et al., should be 2019 (instead of 2015)) simply provided the technology for people to share sounds and music brought on their portable devices. More opportunities for instantaneously co-creating the environment could nevertheless be envisaged.

THE USE OF VIRTUAL REALITY IN CO-CREATING SOUNDSCAPES

A co-creation process requires a good representation of the object of design that is understandable by all stakeholders. The perception of the sonic environment requires full embedding and a realistic context. Hence, the spatial nature of a sonic environment as well as the visual context need exceptional care. Through three examples where virtual reality was recently applied in urban soundscape composition, the available technology and its use are discussed.

Evaluating the urban soundscape in a virtual context

Co-creation requires stakeholders to be aware of the issue at stake. Lay people are often not aware of the influence that sound has on the perception of the urban environment. When a public place appears in popular media, the image may be rather correct, but the natural sound is often replaced by or mixed with music and narratives. Thus, some education of the people is required. To this end, a database of recordings of urban public places in large cities across the globe was constructed. The selection of public places was guided by local inhabitants. For this, using an online interface (Fig. 2) they located places in the city with a distinct soundscape: chaotic and restless, full of life and exciting, lifeless and boring, calm and tranquil.

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Fig. 2: Web interface used by local inhabitants for selecting public places where typical soundscapes can be found. Source: Authors.

At the locations most frequently selected by the local inhabitants, recordings of 360-degree video (GoPro Omni spherical camera system, consisting of 6 synchronized GoPro HERO 4 Black cameras) and first-order ambisonics (Core Sound TetraMic microphone with windshield and Tascam DR-680 MkII 4-channel recording device)

were made during 10 to 15 minutes. For reference, binaural audio (HEAD acoustics HSU III.2 artificial head with windshield and SQobold 2-channel recording device) was also added. Fig. 3 shows the recording equipment on a square in Boston, USA.
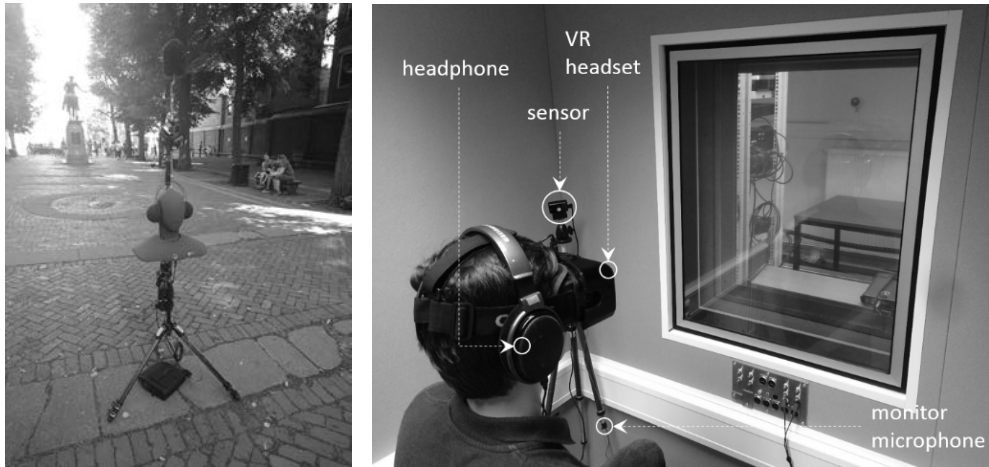

Fig. 3: Left: Recording setup used to collect 360-degree video, ambisonics and binaural sound field; Right: Playback setup with VR headset and headphones. Source: Authors.

Post-processing of audio and video was performed using a range of software, including Kolor Autopano Video and Autopano Giga for stitching and time synchronization of video from 6 separate cameras into one single 360 degree video file, and visually masking of tripod and binaural/ambisonics microphones in the video; HEAD acoustics ArtemiS 8.3 for processing of binaural recordings and calculation of acoustical properties; VVMic 3.5 for processing of ambisonics recordings, conversion from A-format to B-format using microphone-specific calibration/equalization files; FFmpeg for synchronization of audio and video, colour calibration of video, and final selection of segments and combination of media into .mov container; and Google Spatial Media Metadata Injector for adding 360-degree video and spatial audio metadata to the videos.

The visual presentation is achieved by GoPro VR Player (version 3.0) software, which allows to play back video including spatial audio. The 360-degree video is presented through an Oculus Rift head-mounted display, and the participant can freely move its head and look around in all directions. The audio is played back through Sennheiser HD 650 headphones, driven by a HEAD acoustics LabP2 calibrated headphone amplifier. In Sun et al. (2018a) realism and immersion of ambisonics and binaural reproduction have been evaluated with a test panel. No significant differences were shown between ambisonics and binaural reproduction on the perceptual dimensions: envelopment, immersion, representation, readability, realism, and overall quality provided that the head was fixed in the direction corresponding to the binaural recording. On the above dimensions a score of 4 out of 5 was typically reached.

Currently, the database contains around 100 urban recordings collected in 9 cities[1]. For these recordings to be useful as examples of good and bad practice, they need to be classified and indexed. The most abstract level of classification could follow the scheme of Fig. 1. To that end, panels of 20 persons (age between 25 and 35 years, gender balanced) were invited to experience the recorded environments in virtual reality (Oculus Rift head-mounted display, Sennheiser HD 650 headphones, driven by a HEAD acoustics LabP2 calibrated headphone amplifier). Participants experienced the VR setting during one minute after which they answered a set of questions related to the contribution of the sonic environment to their overall experience. More details of this experiment can be found in Sun et al. (2019). As classification by listening panels is very labour intensive, models were constructed that predict the degree of belonging to any of the soundscape classes based on (visual and) acoustic quantities.

In Fig. 4 each of the recordings is represented by a dot in the two-dimensional plane spanned by the first principle components of the classification of foregrounded soundscapes. Backgrounded soundscapes classify in an orthogonal dimension, yet their projection is also shown. Prototypical examples can be retrieved by selecting specific dots in this classification scheme.
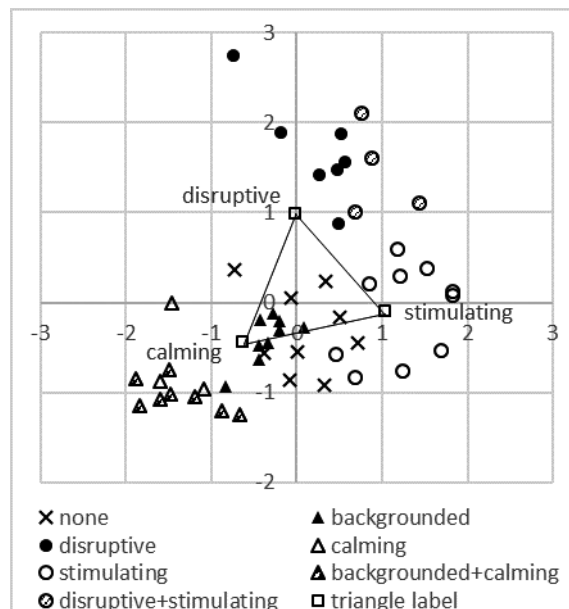
Fig. 4: Fuzzy classification of soundscapes shown in the plane of the first principle components. Source: Authors.

Intervention on a bridge

Co-creation of the design of the public place could benefit from the ability of lay persons and stakeholders in general to evaluate alternative scenarios in virtual reality. In this example, it is shown how distinctive designs of a bridge over a ring road including noise barriers and focusing on matching design styles, could be compared and evaluated by stakeholders. The ecologically valid way to experience a bridge is while walking across it. Thus, also in virtual reality, this walking experience should be simulated. For this, the broader context was recreated in 3D Studio Max software and Unity Game Engine. For reproducing the sonic environment, one could also follow the ab initio approach and combine the sounds of individual cars, trucks, talking people, etc. available for the Unity engine. Although this approach, referred to as auralisation (Georgiou & Hornikx, 2017), has made tremendous progress over the last years, it remains difficult to create the correct sonic ambience that allows people to identify their familiar city. Hence, a hybrid approach was used. The general sonic environment was recorded using four channel ambisonics (Soundfield ST350 Portable Microphone System), while the sound of specific salient elements in the visual scene such as a tram or a person walking, was added using Unity. To account for the presence of a new noise barrier, the recorded sound was attenuated using a spectral filter matching the numerically simulated physical attenuation (Sanchez et al., 2017).

Four alternative designs (Fig. 5) were created and presented to a panel of 75 individuals. Each visual design was accompanied by the matching sonic design. Sonic environments differed in the contribution of the highway which corresponded to
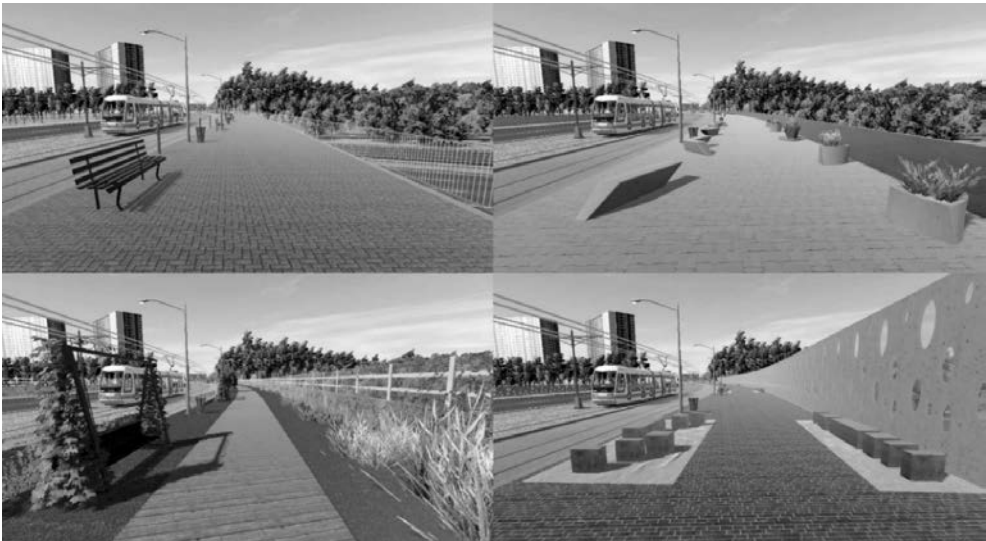

Fig. 5: Four design alternatives presented in the virtual environment to the lay people. These designs are labeled traditional, modern, vegetated, and whimsical from upper-left to bottom-right. Source: Authors.

average sound levels of 76.5, 68.6, 65.3, 64.1 dB(A), respectively depending on the screen height bordering the bridge. The sound of the tram, other persons walking in the scene, and one's own footsteps were kept the same in the four scenarios. The latter is important as it sets the frame of reference for the listener (Aletta et al., 2016). As the purpose of this research was to prove the applicability of the technique for evaluating an audiovisual environment, participants in the study were not local inhabitants nor stakeholders thus making them more objective in a way. In the actual co-creation process, inhabitants and other stakeholders may bring in their own knowledge about the place.

Participants were asked to rate the pleasantness of the experience of crossing the bridge on an 11-point linear scale: "How would you rate your experience while passing this bridge to go from the city centre to the park?" The textual descriptions of the endpoints were "very unpleasant" (-5) and "very pleasant" (+5). Fig. 6 shows that the green design D3_vegetated including some traffic noise reduction through a small noise barrier is clearly preferred.
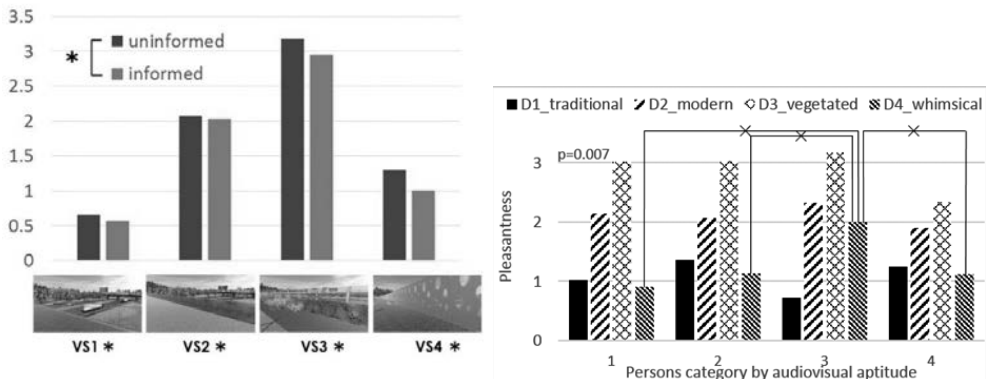

Fig. 6: Average evaluation of pleasantness rating (on a scale from very unpleasant (-5) to very pleasant (5)) of walking across the bridge; LEFT: in the informed situation, participants were asked about auditive and visual elements before asking them to experience the walk again; RIGHT: rating of the designs according to the audiovisual aptitude groups. Star indicates statistically significant differences. Source: Authors.

For this book chapter, some secondary effects that might need to be considered during a co-creation process relying on reproduction of a sonic environment in virtual reality are highlighted. In view of the importance of attention on the perception of soundscape one should be aware that presenting sound through headphones automatically focuses a person's attention on the sonic environment. In the case of the bridge, the aim is to background the sonic environment and thus to steer attention away from the possibly disturbing highway noise. To explore whether the VR environment creates an environment where sound could be backgrounded, the participants were asked to do similar experiments on several separate days. Although

participants were not aware of this, on each day the visual environment was the same while different sonic environments were presented. The label "uninformed" in Fig. 6 refers to this situation where only designs with physically matching sonic environments are displayed. On the last day of the experiment, participants were asked to rate the importance of the different visual and sound elements in their overall assessment (e.g. the presence of green or the sound of the tram). This was expected to make them more aware of the sonic and visual environment and could make them evaluate the virtual walk across the bridge differently. The label "informed" in Fig. 6 refers to this situation. Although this leads to a statistically significant difference in rated pleasantness level on average over the 75 participants, the difference is negligible compared to the difference in rating between the different designs.

Similarly, it was investigated whether different people would rate the designs differently (Sun et al, 2018b). Using a deviant detection experiment where sonic and visual elements were removed from a scene, participants were classified into: 1) is very good in detecting auditory deviant stimuli but gets distracted by incongruent visual information; 2) is generally not good in detecting deviant sound; 3) is very apt in detecting deviant sound with or without the presence of visual information; 4) tends to make less mistakes when visual information is included even if it is incongruent. The right pane of Fig. 6 shows that only for people belonging to category 3 and only for the design 4 containing the high noise barrier, a significant difference is observed. Over all groups, the order of preference stays the same.

AUGMENTING THE SOUND ENVIRONMENT OF THE PUBLIC SPACE BY CO-CREATION

Augmenting the sound environment of the public space could also be achieved by adding electronically reproduced sound. With respect to the soundscape categorization explained above, this approach is mainly suitable for transforming backgrounded soundscapes to supportive soundscapes. Users of the public place could actively co-create the sonic environment by interacting with the playback device. This type of co-creation is far more hands on, interactive, and unstructured than other explained situations of co-creation.

Before deploying the playback equipment and the collection of sounds to the field, a lab test was performed. For this, the virtual environment discussed before is used. A recording at the locations where the playback device will be deployed is added. For visual presentation, an Oculus Rift was used. Sound reproduction used an open headphone (Sennheiser HD650). This allowed the person wearing this headphone to hear other sounds from the environment than those played back from the headphones. The test was conducted in a silent, semi-anechoic room using the playback device placed roughly at the same height and distance as it will be deployed in the field.

Eight natural sound fragments including water sounds, wind, birds, and insects are made available for mixing with the existing sound environment during co-creating. These added sounds can be played simultaneously at a desired level by moving the mechanical sliders of the mixing panel. Soundscapes that were classified as back-grounded were selected. A snapshot from the visual environment for the four most relevant examples is shown in Fig. 7.

Fig. 7: Snapshots of the public places where the soundscape augmenting sounds are tested: upper left CP2: Ghent, Belgium; upper right R0008: Montreal, Canada; lower left: R0017: Boston, USA; lower right: R0043: Hong Kong. Photos: Authors.

The compositions created by the 10 participants in the virtual co-creation is identified by the position of the sliders. The diversity of compositions is large both between people and between environments. Nevertheless, there are also some trends that can be observed from the averages shown in Table 1. The sound of a single sparrow seems appreciated in all contexts. The mixture of songbirds scores high except in context R0017 (Boston) where people are prominently present. Seagulls pop-up in R0043 (Hong Kong) where the waterfront context seems to create an expectation for such seabirds. Amongst the water sounds, the stream, a sound that is fluctuating in level, seems well appreciated overall, except in the very open park scene (R0008).

This lab test showed which types of natural sounds should be made available at the co-creation loudspeaker systems. One important aspect of these sounds is that they should be noticeable in the hardly fluctuating but rather loud background sound that is often found in urban public places. The equivalent sound levels of the four VR samples (CP02, R0008, R0017, R0043) used in this experiment for example were 55.8 dB(A), 54.7 dB(A), 65.8 dB(A), 62.1 dB(A) respectively. Bird song has a high fluctuation strength and thus adding these sounds to the constant background hum, is expected to make the soundscape more eventful. To some extent, the same effect is obtained by adding the water stream. The typical high frequency tonal compo-

nents in the bird sound is also expected to make these sounds clearly noticeable and distinguishable. This allows the co-creators to move the overall soundscape from backgrounded to supportive.

Secondly – referring more to the pleasantness dimension of soundscape – sounds are recognized, they are given meaning. Although one might expect most natural sounds to contribute to the pleasantness of the soundscape, the sounds of raindrops, rustling leaves, and waterfall are not sufficiently different from the urban background to be recognized as natural sounds. Thus, they seem less appropriate candidates to be made available for co-creation. Plausibility of the sound and congruence with the visual scene also turn out to be very important. For example, the seagulls are only selected in R0043 where the visual context gives the impression of being close to the sea. But also the relatively low average level of the sound of the stream in R0008 could be an indication of lack of plausibility: the open view does not make the presence of water sound very plausible.

	1-bee	2-seagull	3-sparrow	4-raindrops	5-rustlingleaves	6-songbirds	7-waterfall	8-waterstream
CP02	6	-2	50	12	4	46	16	38
R0008	-4	-3	47	11	7	29	7	1
R0017	-3	0	46	6	-6	19	18	43
R0043	-16	31	47	1	0	36	7	41
average	-4	6	48	7	1	32	12	31

Table 1: Averages over all participants of contributions of each added sound based on the reading of the amplification sliders (in slider-indicated dBs)

To bring co-creation to the field, some technical questions need to be addressed. A mechanical slider is not robust enough to be deployed in a park, but fortunately, many people carry a smart phone or tablet with wireless connectivity. Hence, an app ("Zuidpark soundscape app") is created that allows users via virtual sliders to control the sounds played at the nearest loudspeaker. The loudspeaker box contains a Raspberry Pi and an amplifier. All sounds are stored locally on Raspberry Pi which does not require internet connection. On the other hand, the device itself is configured as a WiFi access point to which the smartphone app can connect to. This implementation immediately determines the spatial extent from where the loudspeaker can be controlled: the spatial range of a WiFi access point.

To control the temporal aspect of the creation, again a technological solution is found. The sounds continue playing as long as the controlling device remains

connected to the WiFi. To allow other users of the place to enjoy an interesting sound environment without creating it, there is also an option to start playing and rating previously composed mixtures. This soundscape co-creation platform is deployed in Gent, Belgium; more information can be found in Van Renterghem et al. (2020).

DISCUSSION

In this chapter, three examples were presented of co-creating the sonic environment of public places. Recording 360 degree visual scene with four channel ambisonics sound seems appropriate to create a high level of envelopment, immersion, representation, readability, realism, and overall quality. By classifying many recordings from public places in cities across the globe, an instructional database is obtained. The high-level classification in backgrounded, disruptive, calming and stimulating environments results in distinct classes for most of the available recordings. This shows that such a distinction is rather univocally made by different people. The more popular classification based on a soundscape interpretation of the two-dimensional circumplex model typically fails to find good examples for the monotonous quadrant. The classification could easily be extended using a taxonomy such as the one presented by Brown et al. (2011).

When VR is used to present alternative solutions to stakeholders in a co-creation process, care is needed to avoid excessive attention focus on a single component as such attention focus would not occur in the real situation. Using the example of a bridge design including noise barriers, it became clear that persons experiencing the environment did not focus on the sound: this would have led to rating the design with the lowest level of highway traffic noise as the most pleasant situation. On the contrary, the transparent noise barrier enriched with green elements was generally preferred. This finding is in accordance with previous research that showed that for transparent barriers perceived loudness and noise annoyance were judged lower than for opaque barriers (Maffei et al., 2013) and vegetation enhances the expected noise reduction and the aesthetic value of noise barriers (Hong & Jeon, 2014).

This experiment also showed that presenting scenarios through VR is a stable technique. Pleasantness rating of the experience is generally lower after people have been asked in detail about various elements of the experience, amongst which the sound of the highway. Nevertheless, even after focusing their attention, people rank the designs in the same order. Similarly, personal factors seem to have an influence on how the virtual walk across the bridge is experienced, but this difference only changes the order of preference for one sub-group. Thus, although it may be advisable to include a variety of people in the co-creation process, it is expected that the outcome will not depend too strongly on the selection of participants.

Public places have been used for performing street-art since centuries. These activities significantly change the soundscape of the public space. The last example

given in this chapter introduces digital technology to more subtly and in a new way changing the sonic environment in parks through a co-creation process. Hidden loudspeakers are used to add natural sounds to the environment. The collection of sounds that could be made available to the live co-creation process was validated in a pre-study in a controlled environment using virtual reality. This showed that the sound of birds is generally preferred but also that the species should match the expectation created by the (visual) environment. This finding is in agreement with earlier studies that explored the perceived restoration potential of bird sound (Ratcliffe et al., 2018) and the effect of bird biodiversity on well-being (Hedblom et al., 2017). The choice of water and wind sounds in the pre-study was also very specific. Findings suggest that the type of water sound is important: the sound of the water stream outperforms e.g. falling water (like a fountain) which is consistent with earlier findings (Galbrun & Ali, 2013).

All the sounds that are added during co-creation to backgrounded urban soundscapes have in common their ability to add Hi-Fi components (Dumyahn & Pijanowski, 2011), to add salient components (Filipan et al., 2019), and to increase natural variability of the overall soundscape (Botteldooren et al., 2006). But also, they all use pleasant and matching sounds, such that the soundscape becomes supportive for the overall experience of the public place. Further analysis of co-created soundscapes will show more precisely which acoustic components contribute most to the overall perception and appraisal of the urban soundscape.

Further analysis might be needed to elucidate the impact of the socio-economic profile of the people involved in the co-creation process, their demographics and familiarity with the places. Already when dealing with sounds alone, personal characteristics play a significant role (like e.g. the noise sensitivity construct, see Schreckenberg et al., 2010). This is further enhanced when audio-visual information is combined when outdoor environments are perceived, for which 4 groups of people can be identified (Sun et al., 2018b). Analysis including other personal factors, and their potential interactions with the presented findings here, would need a much larger number of participants.

CONCLUSIONS

The digital technologies discussed in this chapter are suitable tools for co-creating the sonic environment of public spaces. They allow to instruct stakeholders, present alternative scenarios during a planning phase, and even to augment the sonic experience in real time. In addition, they have the potential not only to improve the perception of environmental noise, but also the overall user experience and appreciation of a public place.

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The effect of public places on community resilience. A case study of the role of social and digital tools in the City of Volos (Greece)

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Abstract - *Community resilience provides capacity to speed up recovery from disruptions, minimizes the impact of crises and helps to plan and adapt to long-term urban challenges. Public places are vital structural elements of the urban environment and they are considered useful tools for community resilience if they have physical and social capacities, with inclusiveness as their conceptual basis. This chapter investigates the main resources and activities of community resilience related to urban public places, and explores whether public places are useful tools for risk mitigation, emergency response, recovery and adaptation. A case study in the Greek city of Volos is conducted. The study explores the existing institutional framework and community building for disaster management, it surveys public spaces in Volos, and explores their role in disaster prevention. Furthermore, the case study investigates social risk mitigation practices in public spaces, identifies challenges associated with community resilience and discusses strengths and weaknesses of using digital tools to overcome these challenges. Within this framework, the potential of using Blockchain technology for strengthening community resilience is discussed by elaborating on its features and existing applications.*

Keywords - Community resilience, risk mitigation practices, public places in Volos, Blockchain technology

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INTRODUCTION

Modern cities face challenges of urban vulnerability in the context of climate change and social crises. Community resilience provides the capacity to speed up the recovery from disruptions, minimizes the impact of crisis and helps to plan and adapt to long-term challenges. It involves empowering individuals and communities to take collective action to reduce exposure to different risks.

In the main institutional framework for disaster prevention in Greece, public spaces are mainly used for providing shelter, gathering of people and distribution of services, goods and information. The social role of the public spaces for building urban resilience is overlooked and it is a central feature of this chapter. In this framework the case study of public places in the city of Volos, in central Greece, investigates the social capacity of public places for risk mitigation and disaster management, analyses the related institutional framework for emergency response and community building practices. It identifies challenges associated with community resilience and discusses the existing and potential digital opportunities, which are used to overcome these challenges. Finally, it investigates whether Blockchain technology can enrich these strategies and further adds to the potential of urban public spaces to enhance their community and urban resilience of Volos. By doing so, this article aims to initiate a scholarly enquiry to understand what is possible when it comes to the potential use of Blockchain technology for strengthening community resilience in public places.

METHODOLOGY

The literature review on community resilience and the role of public places in risk mitigation and emergency response provides approaches for the case study. The case study investigates the main emergency framework and community building practices for risk mitigation and emergency response related to public places in Volos. Consequently, it identifies the main challenges associated with the existing resilience of public spaces and the limitations of already used digital tools. Furthermore, the case study discusses the possibilities for Blockchain technologies to increase the social capacity of the public places in Volos, elaborating on their features and existing applications.

STATE OF THE ART

Components of community resilience: its resources and activities

Different approaches to resilience have been widely discussed in academic and policy literature in recent years. They range from short term engineering resilience, which aims to return any system to its pre-disaster state as quickly as possible (Manyena et al., 2008), to long-term ecological resilience, which has an ability to adapt to adverse events, a capacity to self-organize and change (Angeon & Bates, 2014). Urban

resilience refers to long term resilience of city systems and is defined as "the ability of an urban system and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales, to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity" (Meerow et al., 2016:45). It is described as a sustainable process leading to further improvements, and includes preparation, emergency response, recovery, reconstruction and adaptation (Alexander, 2015). Social resilience is integrated in each stage and reflects the capacity of individuals and communities to be creative during times of stability and to adapt and grow in response to disruption (Keck & Sakdapolrak, 2013).

Community resilience is related to social resilience. It is defined as "the existence, development, and engagement of community resources by community members to mitigate loss and damage from disasters, contributing to community preparedness, disaster response, and post-disaster recovery" (Magis, 2010:401).

The community resources include information, communication, social inclusion, community networks and relationships, and governance (Patel et al., 2017). Local knowledge on risks assist community to mitigate disasters and have a plan on how the disaster response can work. Governance shapes community performance. Infrastructure handles incoming information about a disaster and sends instructions on a response for public support. Community resilience should also be associated to physical resources (e.g. food, water, first aid kits, shelter, transport), which require economic investments. The integration of these resources allows communities to deal with crises, recover and innovate.

Community networks and effective communication are useful in understanding vulnerabilities and facilitate recovery. Social inclusion, group cohesion and building of social capital, inform, engage and empower communities to develop and implement their preparedness, response and risk mitigation. They emphasize the collective actions of individuals and communities in various activities in urban systems, creating new values as their central aspects (Gov. UK, 2016). Social inclusion is "the process of improving the terms of participation in society, particularly for people who are disadvantaged, through enhancing opportunities, access to resources, voice and respect for rights" (UN, 2016:19). Social cohesion refers to the extent of community connections and solidarity. Social capital is a process that relates to bonding or linking relationships (Mulunga & Yazdanifard, 2014).

Public participation, community engagement and co-creation process are participatory tools for social inclusion. Public participation contributes to sustainable decisions, by facilitating the involvement of all people affected, and having participants informed about the impact of their input on the final decision (Creighton & Creighton, 2008). Community engagement is a dimension of public participation and "a process of inclusive participation which supports mutual respect of values,

strategies, and actions for authentic partnership of people affiliated with, or self-identified by geographic proximity, special interest, or similar situations to address issues affecting the well-being of the community" (Jones & Wells, 2007:408). The co-creation process increases opportunities for achieving social inclusion in public places because it recognizes the decision-making rights of people, produces a new public value, promotes self-organization of community, involves a wider range of stakeholders, and empowers previously excluded members (Sanches & Frankel, 2010). Co-creation gives communities and individuals more direct involvement in defining their needs and priorities, collaboratively finding solutions, influencing decisions and achieving better outcomes. Co-creation is "an active flow of information and ideas among five sectors of society: government, academia, users, non-profit organizations, and citizens, which allows for participation, engagement, and empowerment in, developing policy, creating programs, improving services, and tackling systemic change with each dimension of society represented from the beginning" (Leading Cities, 2014:2).

Collective creativity is based on the experiences of groups and individuals and includes joint problem solving and understanding of risks. All participants collaborate and contribute through creative, knowledge sharing activities. The flexibility of the process is achieved by the integration of knowledge of different users, and the understanding that the community can change what is being created.

A combination of appropriate engagement modes also makes co-creation processes more inclusive and accessible. Inclusive strategies for engaging hard-to-reach stakeholders, establishing partnerships and carrying out collaborative work, include workshops, user generated content, digital forms of data collection, prototyping, or other activities to get them engaged around urban problems and suggest solutions.

The role of public spaces in building community resilience

The resilience of public places is closely associated with qualities of urban systems, namely reflectiveness, integration, robustness, resourcefulness and flexibility (ARUP, 2016). These qualities provide public places with adaptation capacities to deal with multiple threats because they offer social (community resilience), economic (encouraging local economy), environmental (reduce urban heat effect, provide water storage and carbon absorption) and personal health benefits (Kabisch et al., 2017). Literature findings suggest that by embracing these qualities, public places should act as "agents of recovery". They provide essential life support (e.g. shelter, gathering of people and distribution of services, goods and information) (Jayakody et al., 2016) and essential elements of risk mitigation by strengthening social capacity of existing and new communities and building place capital through place making and inclusive practices (Jacobs, 2015).

In particular, it is noted that there is pressure on public places to provide forms of direct democracy through inclusive practices, meaning providing people's

involvement in decision-making and the rights to participate in society (Maduz, 2010). For example, public spaces can facilitate interactions of communities in planning, selecting and governing their physical environment and social infrastructure. The collective creativity in public places encourages integration in local societies, social cohesion, knowledge exchange, cultural tolerance and can reduce social instability (World Bank, 2017). It can improve the relationship between local community and newcomers through co-creation, planning, and cooperation in hosted activities. And as a result, it can foster communities that are more socially, physically, and economically viable, increase the resilience dividend and create a place capital, a shared wealth (built and natural) of the public realm (PPS, 2011).

Different types of public spaces have different physical capabilities for providing community resilience and tend to compensate for each other when challenged by different risks. Thus, their integrated network provides diversity to the city fabric. Their role as locations of information exchange and management in particular, allow their characteristics to "blend together with the equivalent of ICT, to give or gather information, to aid co-creation of space, to allow crowd sourcing of information and opinions, and to allow affective sharing or self-monitoring of activities… "(Cyber-Parks Agora, 2017). The role of ICT in planning and maintenance of the contemporary public space, in regard to enhancing urban resilience is significant, dynamic, and fast developing. Within the broad range of ICT, one of the latest kinds that appear to be most promising and most suitable for the above tasks, through various implementations, is the Blockchain technology. This technology is comparatively new, but it has already been successfully used in various sectors such as administration and governance, land registration, citizen participation and public safety. Exploring the potential of improving and increasing resilience through Blockchains, is a significant dimension of research in the immediate future.

CASE STUDY

Characteristics of the urban environment in the city of Volos

Volos, the case study of this research, is a port city in the Region of Thessaly in Greece, and the administrative centre of the former Prefecture of Magnesia (City of Volos, 2018). It is the main urban conglomeration of the municipality of Volos, the area of which, is 385.6 km2. It includes 9 municipal units (Agria, Aisonia, Artemis, Iolkos, Makrinitsa, New Anchialos, Nea Ionia, Volos, Portaria) with an average area of about 27.678 km2 each (Wikipedia, 2018). Despite the recorded increase of population, only few expansion areas are provided for the city of Volos in the Master Plan of the municipality of 2017. According to it, the population increase is expected to be absorbed by a reallocation of the population from central to non-central zones within the city.

The high density of buildings, in relation to the relative lack of open spaces is the characteristic of the recent urban fabric of the city. A City Plan for Volos was

conducted at 2004, which allocated 3.53% of the area of the city to public spaces, corresponding to 7.02 m2 of public space per resident. The road network occupied 22.9% of the area of the city, corresponding to 45.69 m^2 per resident (Lalenis, 2004). These provisions were also adopted in the Master Plan of 2017. Only 62 % of the area officially designated for public spaces has been materialized and is currently used, due to the lack of finances of the Municipality for the necessary expropriations, and the lengthy and complex bureaucratic procedures.

Most of the area used for public places exists in the central sector of Volos, including a sea promenade, different types of squares, and pedestrian routes. Other sectors of the city have very few public places and no community life associated with them. The largest number of small public parks are found in the area of Chiliadou. The area of Karla has the largest municipal central park in the city, and Nea Ionia – the poorest area of Volos - has only one public place, a square adjacent to the church of Evangelistria.

Public places in the city centre, and the ones adjacent to the important public buildings (e.g. museums) have been maintained well, they have some shading, and occasionally they are used by the local community. Locals and tourists frequently visit squares containing churches. Facilities for different activities (e.g. benches, kiosks, playgrounds and sport facilities) are provided only in some public parks. They are well maintained and visited by different social groups. Small squares, adjacent to main streets, have good shading but have no furniture for users and are poorly maintained. Public spaces in Volos were assessed by the public as of medium quality (49% of respondents), while 20% of respondents considered the quality of public places as inadequate. Reduction of unemployment and increase of tourism have been rated in local polls as priority issues for public policies. At the same polls, the resilience of urban environment was not mentioned at all by the respondents. This is indicative that the resilience plans for Volos were not adequately communicated to the public.

Past disasters in Volos, main emergency framework and community building practices.

Volos has suffered major social crises and natural disasters in its past. In the 1920s, large numbers of Greek refugees fled from Turkey to Greece after a war between the two countries. A number of 13,773 came to Volos, which was more than 40% of the population of the city at that time. "In 2016, until the closure of Balkan route from Turkey to Northern Europe through Greece, Volos experienced another flow of refugees." A refugee camp for 200 people was set up at the outskirts of the city, at a space which was previously used for car exhibitions. Concerning natural disasters, the most significant ones in the history of Volos occurred in the period 1952-1957. They included a deadly earthquake at 1952 and a big flood of Anavros River of 1956. Nowadays, air pollution from the TITAN cement factory, at the east part of the city, and its waste burning facilities is a serious health hazard for the local population.

Risk mitigation and emergency response in Volos is addressed on different levels by EU, Greek government, and municipality institutional frameworks. Xenokratis Plan is a general emergency framework of the Ministry of Internal Affairs of Greece (General Secretariat of Civil Protection, 2003). Xenokratis Plan is further specialized by each municipality according to its local risks and characteristics. For Volos Municipality, it focuses only on seismic phenomena. It includes characteristics of earthquakes, identifies risk mitigation strategies, emergency response and responsible civic and administrative departments. It describes administrative procedures, and hierarchy and level of responsibilities of civil departments. It also lists duties of the Local Government during and after earthquakes, and contains instructions concerning provision of food, water, means of transportation, fuel, temporary shelters, medical supplies, machinery for removing the ruins, sanitary provisions and transport, etc.

Xenocratis Plan considers public spaces in Volos as the main providers of shelter and spaces for gathering during evacuation, providing a list of open / public spaces and evacuation routes to transfer the population away from the city towards the neighbouring city of Larisa and Mount Pelion to the north and east of the city. Xenocratis Plan does not define criteria for selection of public places for evacuation such as levels of permeability, tree canopy, population density capacity for multiple use, typography, accessibility and connectivity with the main evacuation roots. The access roads to the emergency refuge spaces are not listed. Flood zones are not specified, and consequently, some places for gathering during an earthquake have high risk of being flooded (Papaioannou, 2017).

Individual and collective action for disaster risk mitigation is essential, especially if government response to an emergency fails. It includes community engagement, public-participation and co-creation, aimed at bringing communities and different social groups in Volos together for collaborative response. The case study revealed a number of community building projects in Volos, which aim to encourage local communities to take control of changes in the city. These projects combine online with offline approaches. The 2nd CAPS community workshop was held in Volos aimed at embracing a number of top-down social initiatives, promoting active citizenship and encouraging Digital Social Innovations (CAAPSI, 2017). Several other projects in Volos aimed at improving social networking to increase community resilience and to integrating different social groups, such as Roma and immigrants, into the local community and raise their disaster risk awareness. They used physical events and digital tools for creating augmented reality. An indicative example is the EU-funded EDUCEN project which conducted a study and organized social networking events in Volos focused on the role of inclusive and participatory decision making and cultural memory in disaster management (EDUCEN, 2015). The project proposed collaboration between citizens, civil protection and local authorities to collect cultural memory about people and their behaviours in Volos disasters,

in order to build a better strategy for disaster risk mitigation and emergency management. Social groups and refugees' associations were involved in focus group discussions on how 1952-1957 disasters were perceived by different social groups. The social groups involved in the project included 1st Primary School (1933) of Nea Ionia, which was the first school in the refugee settlement and a landmark of refugee identity, and the associations "Eglezonisi" (1924) and "Iones" (1994), whose aims are to preserve, maintain and convey the history and tradition of Asia Minor to the next generation. The project also brought together the Museum of the City of Volos and the Earthquake Planning and Protection Organization of Greece (EPPO) to develop digital tools and games to advance visitors' disaster awareness, targeting teenagers, as one of the most challenging group of visitors.

Students of the University of Thessaly initiated several co-creation projects aiming to engage different social groups in urban participatory and digital design experiences at the University Square in Volos, providing hotspots that allow either local citizens or tourists to create interactive portraits of the city (EINS 2014). The VolosGeist project collected local knowledge about the spirit of Volos' neighbourhoods to build a digital memory map of the most remembered places in Volos, covering the whole city with photos from 354 places and includes a 1 minute web game. (EINS, 2014). Exchange and solidarity networks were also popular in Volos. Going back to June 2010, when a Volos-based bartering network of 50 members including local teachers, plumbers, farmers, etc. started the local bartering currency TEM (Papadopoulos, 2015). They were using TEM Magnisia website[1] for membership accounts and recorded transactions. Recently the professional network "Craftspeople" was set up to establish a mutually beneficial and professional partnership by using its own digital platform (Design for the Living World 2018).

The main challenges associated with the existing resilience of public spaces in Volos and limitations of used digital tools.

The Case Study identifies the following requirements which might improve and enrich risk mitigation practices in Volos:

- Improve administration, communication, participation, data collection and reduce costs.
- Improve communication of emergency framework (Xenocratis Plan) to the population.
- Encourage social groups in related collaborative actions.
- Undertake social mapping to gain insight into how community members perceive self-protection and their relationships with other key stakeholders.
- Generate an active network and enhance dialogue for disaster mitigation between different players (such as experts, civil protection practitioners, local decision makers, schoolteachers, community groups, etc.)

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[1] www.tem-magnisia.gr

- Raise disaster risk awareness on the cultural aspects of disaster management by bringing together museums and the disaster prevention community with the population. Identify and communicate how memory of past crises of disasters is embedded in history, especially for the non-locals.
- Raise disaster risk awareness of the most vulnerable groups (Roma, refugees, elders, and teenagers).

Referring to the role of public spaces in community building initiatives, there are very few community events associated with public places and they operate at a relatively small scale. The seafront promenade is considered the main location for recreation, and socializing. Christmas and Easter fares and the Volos summer festival are held in the central streets of Riga Fereou and P. Mela, the square around St Nikolas church, Old city walls and the central pedestrian area of Volos. Weekly and seasonal street markets in Volos are used for social interaction for all groups in the community, but most significantly by older people, women and community of traders.

In this effort, public spaces in Volos, have the potential to act as an agent of recovery, facilitating social interactions for disaster risk reduction. In particular, providing entertainment, street musicians, accessibility, market stalls well managed, and park furniture with good and innovative design, (attention to seating, shading and lighting) can make a large difference to the usability and vitality of public spaces. These improvements will create opportunities for social groups for place making, public participation and co-creation of common values including addressing social challenges of disaster risk reduction.

Accordingly, the Master plan of Volos focused on improving public spaces as priority A for implementation by 2020. It includes:

- Redesign and improvement of use of public places and squares.
- Provision of new open spaces and acquisition of appropriate land for them.
- Life plus program, developing local plans for climate change mitigation.
- Flood management studies.
- Smart city platforms.

However, it is noted that formal institutions are extremely weak regarding the support of community resilience initiatives. Evidence shows that digitalization of the social initiatives in Volos is limited due to the lack of investments and it is operated mostly outside public services. The administrative organizations that could benefit from digital social innovations often do not have enough skills, capabilities and resources to make the most of this opportunity. Occasionally, it is informal structures that take leadership in organizing local communities through a process of participation, engagement and co creation. As an exception to the inabilities of the administrative structures, the University of Thessaly together with start-up companies are promoting new technologies and knowledge. Their contribution, combined with

the bottom up approach to low-cost digital networking infrastructure in Volos, is an existing strategy for community resilience.

In most community resilience projects in Volos, conducted either by the University of Thessaly or by informal local collectivities, "digital layers" had been used, aiming to provide new resources for interaction and users' empowerment. These digital tools attracted particular groups of users (i.e. young people and newcomers in Volos) because it encouraged them to be socially active, allowed for distant contacts and increased their opportunities. Nevertheless, it was proved that there were limitations in their use. IT as a tool for community resilience requires leadership and adminis-tration of the platform, and creates significant hidden costs of moderation, both for eliminating inappropriate content and for improving transparency, immutability and security of interactions. These limitations in the use of IT tools encouraged forward thinking into the possibility of using Blockchain innovative technologies for commu-nication, and information production, sharing and management.

THE POTENTIAL OF BLOCKCHAIN TECHNOLOGIES TO ADVANCE RESILIENCE IN PUBLIC PLACES OF VOLOS

Current studies have shown that Blockchain-based solutions can advance current Internet of Things (IoT) ecosystems, based on centralized cloud servers (Kshetri, 2017). Blockchain is a linked list of blocks, which contain data and a hash pointer, indicating its previous block. There is no central server and all decisions are taken in a democratic way, when the majority of the nodes need to come to an agreement and make a decision. Every node in the system holds a separate copy of the Blockchain, data cannot be duplicated, and it maintains its integrity. Adding data to a Blockchain is simpler than deleting or changing existing data. It eliminates the need for a middleman to support communications and provides a security of stored data by using digital signatures and hashing. Each database can operate on different Blockchain consensus levels, thus allowing data to be verified and secured according to the nature of the transaction. Therefore, some studies claim that Blockchain provides a difficult to attack, permanent and resistant distributed database, containing unique features such as decentralization, immutability, integrity, traceability and security (Kukeshova, 2017; PWC, 2018). These features of Blockchains could impact society at large. They have been successfully used in different sectors including government, culture, health, real estate, transportation, citizen participation and public safety (Galen et al., 2018). Existing Blockchain applications have shown that Blockchains are successful in providing interactions, transactions, authentication, bringing in and storing values, whether it is money, goods, property, votes, etc. within the related network, accessible by anyone who is part of the chain (Crosby et al., 2015).

In this framework the unique features of Blockchains can be used specifically for improving the resilient qualities of public spaces (e.g. integration, robustness and resourcefulness, mentioned in par. 3.2 and facilitate adaptation capacities of public

spaces, turning them into agents for emergency response and risk mitigation. As such Blockchains can improve facilitate and manage the provision of essential elements of life support and information in public places, as main places for gathering for evacuation during crisis. It can improve administration and communication of Xenocratis Plan in Volos (see par. 4.2). Thus, it can facilitate different peer-to-peer communication, resource allocation, infrastructure for collecting, storing and sharing information across a network, public participation, tracking and manage supply chains and platforms, which connect different services, adding greater transparency and security to all processes (Berryhill, 2018). Moreover, challenges of existing community projects, identified in par. 4.3, calling to improve the administration, management, sharing and verification of sensitive data, and the limitations of currently used digital tools, suggest that Blockchain technology can be a viable solution. Blockchains can provide a decentralised shared infrastructure for people in Volos to collaborate with one another, including risk awareness and self-protection.

Blockchains are capable of supporting communications and administration of community response groups, engaging local groups with civil society organizations in Volos. It can facilitate place making by providing co-creation platforms, crowdsourcing and creating learning opportunities in public places. It can be used to manage social events, to connect the most vulnerable groups in Volos, enhancing their social and environmental responsibility and to provide security, financial inclusion and transparency to the management structure.

Although the characteristics of Blockchain technologies may bring us more reliable and convenient services, the challenges behind this technology are also important. The concerns about high standards of security, speed, transparency and privacy of Blockchains have been raised in the current studies. As such, Blockchains can compromise people's rights to modify or delete their personal data because stored information cannot be changed. Blockchain can become expensive when data becomes bigger and it requires large storage space and time to synchronize and update it (Lin & Liao, 2017). It appears that decisions on the use of Blockchain technology to support strategies for community resilience in public places should be made independently, each according to the requirements of the individual projects.

CONCLUSIONS

Community resilience provides capacity for urban systems to speed up recovery from disruption, it minimizes the impact of crises and helps to plan and adapt to long-term challenges. Public places can act as an agent for disaster reduction by facilitating social interactions, inclusive practices (placemaking) and collective creativity (public participation, community engagement and co-creation) and thus contributing to community resilience. The case study showed that Xenokratis plan, the main institutional framework for emergency response in Volos, facilitates only partial resilience of the city because it focuses mainly on administrative procedures for emergency responses to earthquakes. It does not cover other possible disasters

and demonstrates poor management and communication. The case study revealed that existing social projects are successful in bringing communities and different social groups together for disaster mitigation and collaborative response. Administration, communication, issues with connection of social groups and hidden costs of moderation are main challenges of social projects for disaster management, calling for enhanced effectiveness, transparency and security of interactions and requiring innovative technologies for communication, information production and sharing.

Public places in Volos are underused, they facilitate social interactions only to a low degree and require physical improvements. The Master Plan of Volos puts as Priority A to increase the number, diversity, accessibility and connectivity of public spaces. This study proposes that a strong connection should be made between community resilience practices and public places. As such, public spaces should be provided with the sustainable qualities of resilience by design and in use. Community leadership in use and management of public places can create opportunities for social groups for place making, public participation and co-creation of common values. Different events in the public places organised by local communities can further generate an active network for disaster management. As it concerns community resilience projects in Volos, there is a presence of digital layer in each project, aiming to provide new resources for interaction. Nevertheless, the digital inclusion requires leadership and administration of the platform, improved transparency, immutability and security of interactions, while it has significant hidden costs for the moderation of the platform. These limitations in the use of IT tools indicate that forward thinking is required into the possibility of using Blockchain technologies for communication, management of information and sharing

Although the characteristics of Blockchain technologies may bring us more reliable and convenient services, the concerns about high standards of security, speed, transparency and privacy of Blockchains have been raised in many studies, noting that Blockchains have their limits in areas that intersect with social impact, including human rights. Decisions on the use of Blockchain technology to support strategies for community resilience in public places should be made taking into account the requirements and particularities of each project. At this stage, Blockchain technology is very much about potential, and this is why much of this chapter's content is about ideas leading to a broader understanding of the ability of this technology to improve community resilience in public spaces.

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Technology and community communication: the use of radio broadcasting as a strategy for urban sustainability

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Abstract - *This work addresses a study developed in the city of São Paulo (Brazil) with the Rádio Comunitária Heliópolis (Heliópolis Community Radio Station), which from Monday to Friday, from 12h00 to 14h00, broadcasts the programme Bairro Educador (Educating Neighbourhood). The research was conducted between November 12 and 16, 2018, aiming to understand how a community radio station can contribute to sustainable urban development. By means of participant observation, the programme schedule and episodes (via radio and the internet) and the broadcasted interviews were analysed. Despite the anthropological approach, the research was based on the theory of communication, using the concepts of social marketing and communication for development, aimed to capture changes in awareness, behaviour and human action due to the challenges imposed by contemporary society. The concepts used challenges habits and cultural and social attitudes standardized and trivialized for decades by the social structure in force. The broadcasting schedule, directed at urban sustainability, indicated strong appeal for the listeners, especially when an average of 100% increase in audience was observed the moment it was disseminated. This appeal was reaffirmed in the qualitative analysis on the listeners' participation in the social networks. These allow us to conclude that despite the difficulties in altering the population's deep-rooted behaviour standards, it is possible to envisage possibilities for social transformation using diversified communication technologies. The literature, as well as the phenomenon observed, indicates that different factors may influence actors' involvement in the search for collective solutions for common problems. It was possible to verify that a broadcast programming strategy aimed at raising awareness, mobilizing and sensitizing, placing the common citizen in the centre of the proposals, can have a significant impact in solving or reducing the problems related to urban sustainability.*

Keywords - Community broadcasting station, local urban sustainability, communication technologies, community coexistence

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INTRODUCTION

Heliópolis is the largest favela (slum) in the State of São Paulo, both in size and in number of inhabitants. With about 220,000 inhabitants, it is the second largest agglomeration in Brazil, after Rocinha, in Rio de Janeiro, with people forced to live in inhuman conditions, as shown by recent census data. To provide some order of magnitude, it should be noted that most Brazilian municipalities have an average of 30,000 inhabitants. This community, living in a situation of social vulnerability, faces all kinds of difficulties, but first among them is the accumulation of solid waste turned into trash. Nevertheless, some positive aspects have called our attention and serve as a reference of social engagement in the quest for solutions and relations of sustainability. Supported by the community radio, the inhabitants have been mobilized to create and cultivate green areas and to implement projects seeking income sources and economic sustainability, as is the case of Editora e Gráfica Heliópolis (Heliópolis Publisher & Printer), founded to publish books produced by writers of the community and of the region.

In this context, the present chapter aims to demonstrate the relevance of the community radio station as a means to support initiatives and projects directed to environmental and economic sustainability as well as relations of social coexistence, in addition to highlighting the importance of broadcasting technology, by means of information and by revealing the local reality. To meet these goals, the programme 'Bairro Educador' (Educational Neighborhood) was analysed regarding the format used and the contents broadcasted. The research considered a period of one week (from Monday to Friday) covering a total of 10 hours of broadcasting. It is worth stressing that legal hurdles such as the limitation of the broadcast amplitude to 25 watts and the restriction of the height of antennas, among others, were overcome with the advent of digital technology. Actually, the internet, with the use of applications and social networks, namely Facebook, boosted the broadcasting audience significantly, multiplying the number of listeners and fostered interactivity, with visible effects on the community.

Being an instrument of communication with the target population, the community radio seems to be a relevant object of study as regards sustainable urban development. The latter understands the city as an integrated and interlinked system, linking the whole infrastructure with human well-being and the balance among living beings and the society and the environment they live in. The community radio is also differentiated since it does not consider profit or political propaganda its priorities, which allows for greater room in the broadcasting schedule dedicated to dealing with issues and topics of common interest, e.g. public, social, collective and local issues.

Given its nature and vocation, the community radio can be seen as an important instrument capable of influencing, mobilizing, sensitizing, stimulating and engaging people towards social transformation, resulting in changes in behaviour for the

benefit of sustainable urban development. Furthermore, radio has proven to be a technology capable of associating the different stages of technological advancement without forsaking its original characteristics. In this sense, the research rationale is grounded on the theory of communication and on the concepts underpinning daily actions, such as social marketing and communication for development. In this process, the community radio fulfils its role of informing, promoting debate, interviewing, rendering public interest services, educating, playing music, and is targeted at a specific audience sharing cultural, social, religious, linguistic and local affinities. According to Art. 1 of Law 9612/98 (Brazilian legislation for community radio broadcast), community radio broadcast is characterised as low-power sound radio broadcast and tuned in frequency modulation. Granted by the government to foundations, communities and not-for-profit associations, community radios are forbidden from broadcasting publicity and advertisements, and are meant to be additionally targeted at local services in certain neighbourhoods and communities. Across Brazil, community broadcast stations vary, from the manner of managing their operation, to the choice of programme schedule, according to the managers' vocation and interest. In fact, the community broadcasting model differs from the private/commercial and public broadcasting radio. It has autonomy to devise its own personality and cultural identity, so as to meet the community's demands. For Peruzzo (2006), the true radio community is that which is made for and by the community. In these factors lies its fate as social and cultural equipment, able to reach the actors directly involved in the major current urban issues.

THEORETICAL REFERENCES

This research is based on the social marketing concept, according to iSMA, ESMA and AASM[1] (2013). The social marketing concept is far more than social media, for example, Facebook, Instagram or publicity, as it is a tool for changes in behaviour. People involved in social marketing do more than merely educate or inform. Social marketing aims to unfold and to integrate marketing concepts with other approaches to influence behaviour so as to benefit individuals and the community for greater social well-being. Social marketing practice is guided by ethical principles. Therefore, it seeks to integrate research, better practices, theory, sensitive audiences and partnership to inform and to deliver segmented programmes of social change that are effective, efficient, equitable and sustainable. According to iSMA, ESMA and AASM scholars, the pillars of social marketing are supported by mutual benefit, in a win-win situation, guided by the goal to bring about lasting changes. In this sense, its strategy involves the engagement and involvement of social actors to deliver solutions to problems. Social marketing has a great interest in people's behavioural change. Nevertheless, for this to occur, it is necessary to master some concepts and to have

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[1] iSMA (International Social Marketing Association), https://www.i-socialmarketing.org/. ESMA (European Social Marketing Association), https://europeansocialmarketing.org/. AASM (Australian Association of Social Marketing), http://www.aasm.org.au/.

the effective participation of the people involved in the identified issues. These are usually sensitive issues and opposed to the established commercial interests. It is also characteristic of social marketing to avoid advising people on what they have to do. On the contrary, this approach seeks to motivate people towards a behavioural change, discussing the benefits in the short, medium and long terms, and stimulating daily practices that add value. An important issue is to involve people so that they realise that our behaviour impacts society whether positively or negatively, one example of which can be waste prevention. Social marketing recognizes that the change in behaviour is in fact the most complex and long-lasting way for something to occur. Moreover, it advocates that it is the most sustainable way of improving the quality of life.

The research was also inspired by the concept of communication for development (Quebral, 1988; Guglielmone, 2016; Melo, 1977). According to Quebral (1988), communication for development is the possibility for human communication science to be applied in the transformation of a nation. Communication makes a land move from poverty to a dynamic condition of economic growth, enabling greater economic and social equality and, consequently, a better quality of life. This occurs even if there is no consensus regarding the relevance of the general goal of improving the quality of life, a common source of conflicting interests. For Quebral (1988), there will always be conflict with the goals, priorities and acceptable costs, as there is a reality of constant disagreement. In this context, communication for development takes on the function of mediating conflicts since the different viewpoints of the groups of interest have to be publicly expressed. For Melo (1977), communication for development is the kind of communicative action taken for the benefit of the community. It consists of strategies aiming at social, political and economic development, among other aspects, towards social transformation, by means of communication. For Melo (1977), communication can and must be used as a tool of social organization that targets the common good. Hence, communication coupled with the concept of development towards solving conflicts and meeting social demands is an important instrument for integrating the population. In this sense, the concept of communication for development, opened to multiple aspects, can be used as a tool that allows social voices, namely those needing resonance and empowerment, to be amplified.

Guglielmone (2016) sees radio broadcasting as a tool for social development and sustainability. For her, broadcasting is usually distinguished for its capacity to reach out to populations with little or no literacy. Communication for development is thus the field of information and communication sciences in which the broadcasting mechanism is a central concept concerning the mediation processes. Still according to Guglielmone (2016), this kind of study allows us to articulate the issue of technological and production means, reception processes, the participation of the main actors and the expected actions. The author also highlights the intrinsic

relation between development and sustainability, which can be observed in the study on the community radio of Heliópolis, the subject of this research.

RESEARCH METHODOLOGY

Between November 12 and 16 2018, we investigated the Rádio Heliópolis programme "Bairro Educador" and its Social Marketing actions to influence the change in behaviour towards community sustainability. Over the course of a week in this programme, the host Rubenildo Limeira talked to local people involved with projects and actions for sustainability in the community.

The research prioritized qualitative aspects, especially regarding the audience, observation and comprehensive description of the complex relationships between individuals and the urban environment surrounding them. To a great extent, the host made use of narratives by means of radio interviews, as a discursive way that is very close to the anthropological investigation method with the presentation of stories of life (Bauer & Gaskell, 2013). The interviews were important with a view to exploring fully one of the characteristics of radio and its potential in the spectrum of opinions and representations of a specific social reality (Bauer & Gaskell, 2013). In this case, the observation of how a community radio station can use its communication potential and influence behaviour, initiatives and sustainable urban development projects. The participant observation method, also conceived as a part of the ethnographic method, was used for analysing the daily programmes, which occurred in person and systematically. The method of analysis enabled us to know more closely the characteristics of social unity present in the Heliópolis community and its relationship with the community radio of its neighbourhood (Mattos, 2001). The programme Bairro Educador relied on debates, interviews, opinions and information that were recorded and registered in the social media. The total time of recorded materials is 10 hours, and they were selected, analysed and classified according to this research goals of demonstrating the importance of the radio station as an instrument for transforming actions towards urban sustainability. The analysis criterion was thus based on the concepts of social marketing and communication for development, having as a reference the purpose of urban sustainability. The tools for data collection, such as logbook, filming and transcriptions of the programme's sessions, helped understand the context investigated better (Gómez; Flores; Jiménez, 1996; Denzin & Lincoln, 2000). The names of the participants and of the institutions mentioned along the sessions are real, and they gave their consent for dissemination.

ANALYSIS AND DISCUSSION OF THE RESULTS

Rádio Comunidade Heliópolis was initially called Corneta (Cornet). It started operating in 1986 and in May 1992 the station's name was changed to Rádio Heliópolis, as reported by Antonia Cleide Alves, president of Unas (União de

Núcleos Associações dos Moradores de Heliópolis / Federation of Residents Associations of Heliópolis), responsible for the radio station. With over 26 years on air, a great number of life stories have been broadcasted and different community members have spoken into the station microphones. In the 1990s, the radio was closed three times by the Federal Police and suffered serious consequences; its electronic equipment was confiscated and the members of the board of the radio station were criminally prosecuted. This was due to the ratio not having the necessary documentation or being authorized to operate. Only on June 19, 2009 did the station receive permission by the Federal Government and started operating legally according to the Brazilian legislation on radio broadcast.

The radio has a diversified programme schedule and involves a significant number of community programme hosts, ten in total. The schedule is made by the broadcasters themselves, based on the listeners' requests. The station has programmes with interviews, debates, and different music genres, such as forró, rap, sertanejo, popular music, appealing to all the age ranges of the inhabitants. The radio broadcasts 12 hours a day. Information and news bulletins are presented throughout the programmes, as the station doesn't have a newscast. In the past, there used to be a newscast called "A Voz da Unas" (Unas' Voice). "Bairro Educador" replaced this radio programme, which currently has the largest audience of the station's programmes. "Bairro Educador" is broadcast from Monday to Friday, from 12:00 a.m. to 2:00 p.m. Rubenildo Limeira de Souza, who hosts the programme, was born in Cajazeiras, a city with just over 58.000 inhabitants in the rural area of Paraíba (Brazilian North-east Region). According to him, Radio Heliópolis transmits what is considered important to the community.

During the week, Rubenildo plans the production of his programme. On Mondays, he invites community artists, people connected to culture; on Tuesdays the floor is reserved for the community libraries; Wednesdays are devoted to educational issues, with sessions shared with the school Centro de Educação Unificada Heliópolis, involving the participation of students and teachers; on Thursdays, schools and universities outside the community are invited to talk about their different programmes, studies and research; Fridays are reserved for the Movimento de Alfabetização de Jovens e Adultos (Movement for Young and Adult Literacy). This order is sometimes inverted, as guests change their schedules, forcing Rubenildo to make adjustments. The community writers and poets, as well as the inhabitants in general, are also invited to participate and to share their stories.

On Monday, November 12, we followed the programme and interviewed the teacher and educator Marisa Lima, from the Escola Técnica- Heliópolis (Technical School). She came to the station studios with six of her students (Jaqueline, Raissa, Bruna, Iris, Rute and Quézia) to talk about the importance of health food for health and human development at all the stages of life. The students had conducted research on the nutrition of the elderly in a senior citizens' home. Standing out among these

experiences are the concern for and the engagement in sustainability, environmental, economic and social projects involving the production of food in its different scales.

Jaqueline Ramalho, a 16-year-old girl in the second year of the nutrition programme, told radio listeners that good nutrition and good eating habits are directly related to the issue of urban sustainability. For her, as long as people have access to information and the ability to choose, they can opt for sustainably-produced and packed food. As an example, she mentioned the use of peels, such as potato and pineapple peels, which are edible and can also be used to make juice or to fertilize the land. Moreover, she stressed the importance of raising awareness of behaviour changes. Raissa Silva, a 16-year-old girl of the same class, said that nutrition does not solely concern eating. Nutrition consists in something broader, such as "feeding the soul", feeling and relating with people and with the environment. Bruna Oliveira, of the same age and a member of the group, pointed out to the listeners that she chose nutrition because she had always enjoyed cooking as a health factor. Among her concerns was the human right to healthy food. Iris Raquel related the food production cycle to the human life cycle. Rute Graziele (a 17-year-old girl) made a point of emphasizing that nutrition cannot be restricted to the act of cooking; rather, it refers above all to the health care. It is thus a gesture of love for oneself and the others. Quézia Kérin (a 16-year-old girl) articulated feeding with urban sustainability as it regards the community's health. The teacher, Marisa Lima, pointed out that the process of raising the ETEC students' awareness resulted in cultivating a community orchard within CEU Heliópolis, the community they belong to.

The analysis of the first day indicates a strong relation with the concept of social marketing advocated by the International Social Marketing Association, whose principle is directly connected to the behavioural changes that can influence large communities. Furthermore, the establishment of the community orchard, deriving from the process of dissemination and of knowledge exchange, reveals what Melo (1977) defined as communication for development. Hence, the programme of the Heliópolis community radio, as regards sustainability in food production, seems to have managed to aggregate both concepts.

On Tuesday, November 13, the programme schedule took José Genário Pereira de Araújo to the radio studio. Besides living in Heliópolis, Genário is a teacher and the director of Unas. His talk was about solid waste transformed into debris and trash, spoiling the community areas and passageways. He stated that the lack of awareness on the part of some inhabitants was causing serious problems to the community, among which visual pollution, unpleasant smells, proliferation of diseases, pollution of the ground water and of the springs found in the neighbourhood. Another serious issue pointed out by Genário was the lack of public policies for collecting discarded objects, such as old furniture, sofas, cupboards, and household appliances, such as televisions, refrigerators, washing machines. As stated by the interviewee, this was a recurring problem in the community (as well as in other peripheral areas of the

city), usually forsaken by the government. In this sense, Genário called attention to shared responsibilities, involving the community, entrepreneurs and the government. These social drivers could provide guidelines and methods for discarding waste, often reusable. This, according to Genário, would prevent blaming exclusively the community and would also contribute to the recycling process, which, in a community as large as Heliópolis, would yield great economic and environmental benefits. Genário also made use of the radio microphone to talk about the interventions being made to minimize the negative impacts on the public space. As he said, Heliópolis relied on two water springs that were preserved by the inhabitants. It is worth pointing out that one of the water springs is used for breeding fish, which represents the awareness about the use and preservation of natural resources in a fully urbanised area. Furthermore, some areas are being revitalized; vertical orchards have been started and the project Recicla *Favela*[2] *(Recycle Favela)*, still not familiar to most of the inhabitants, shows different possibilities for sustainability in poor and peripheral neighbourhoods. For Genário, the government should install more recycling hotspots[3] in the communities and there could be further investments in community radios so that people were made aware of the sustainability projects and, as a consequence, would be more conscious of their actions. Genário's statement corroborates the perception regarding the potential of community radios as instruments of information and raising awareness for the benefit of the community as regards the sustainability issue in its multiple facets. Genário's remarks were pertinent in a number of ways. The lack of awareness on part of the community should be highlighted. Particular importance should be given to the community radio in this issue, especially for evidencing the possibilities and problems exclusively directed to the target community. The statement made by Guglielmone (2016) seems to confirm the aim of community radios to foster social development by means of dissemination. Additionally, as public perception of social problems increases, the government tends to respond to the social demands, namely those made by voices in accord.

We should note that sustainability issues appear to be consequences of the solutions to the problems addressed. In the first situation, the solution contributed to creating the community orchard; in the second, the proposals went towards creating recycling paths. In both situations, the community radio validated the concept put forward by Guglielmone (2016) concerning the importance of social actors' participation in technological solutions, a place taken by the community radio and its resources for knowledge dissemination.

On the next day, Wednesday, we observed and helped to interview Casé de Oliveira, a biology teacher, a regional environment counsellor and an expert in composting

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[2] Cooperative formed by the inhabitants aiming to recycle solid and organic waste.

[3] Places with coloured containers for solid and organic waste.

and urban agriculture. The interviewee started his talk by reaffirming his belief in the transformation of society towards urban sustainability and, consequently, towards a healthier and more harmonious way of life. His sustainable lifestyle includes nutrition based on insects, such as maggots and crickets. According to him, including insects in human diet causes a far smaller impact on the environment. The explanation is simple and logical: insects occupy smaller spaces and, therefore, cause less damage to the environment. As stated by Casé, cattle breeding, for example, requires vast pasture areas and high water consumption. Casé also explained to the radio listeners his projects for planting seedlings all over the Heliopolis region and his environmental education actions. As a result of this work, he mapped out the degraded areas with accumulated trash, so that they could be covered with trees after being cleaned up. In total, 330 trees were planted, among them several fruit species, such as *jabuticaba (Plinia cauliflora)* specially chosen to attract birds. Casé emphasised the indispensable support of the local population, of the Metropolitan Civil Police as well as the Department of Parks and Environment of the Municipal Government of São Paulo. The new green spaces are now frequently used by children for playing, and also by adults who seek to breathe pure air. According to Casé, the drivers that propelled the project are closely linked to the collective awareness-raising initiatives carried out at schools and in the media.

The interviewee's perception relates directly to the importance of communication for development as referred to by Quebral (1998); at is core is the application of communication sciences for social transformation. It is worth mentioning that communication, which transmits dissimilar interests, must take on the necessary interlocution concerning the disputes inherent to the democratic process. In this sense, rather than being a restricted technology, the community radio can and must be a democratic instrument. Casé's project, a clear consequence of awareness raising processes, based on information and knowledge transfer, denotes the relevance of communication for development and its impact on environmental sustainability.

On Thursday, November 15, we listened to and recorded Jorge Von's experiences. He talked about urban mobility and the negative impacts of vehicles. Jorge, having been an experienced bus driver for over two decades, is an expert on the day-to-day traffic in large cities. Aspects such as long traffic jams, noise and visual pollution, stress and deficiencies in public transport were some of the major problems highlighted. Jorge commented on the great number of private cars on the roads of large cities and pinpointed two issues. First, the still precarious and inefficient conditions of mass transport; and second, the lack of comfort in bus commuting by coupled with the feeling of inferiority of those who cannot have their own cars. However, Jorge stressed the government's concern for investing and expanding the supply of mass transport, as well as for investing in new bus corridors to improve traffic flow. After all, the use of this type of transport is more advantageous for the city in different aspects, including the reduction in polluting emissions. As measures

to reduce traffic congestion and remove part of the cars from the roads, Jorge recalled the private car alternate-day travel strategy[4] implemented in the 1990s by the Municipality of São Paulo. Another measure brought to mind and praised by Jorge was the integration system, which reduces the cost of public transport for users that need to take more than one bus or transport mode. As a further negative aspect, he highlighted the psychological pressure on public transport drivers. For him, a great number of problems could be prevented with a campaign for greater respect and appreciation for bus drivers.

Jorge's thoughts once again highlight three fundamental aspects of communication: the need for awareness-raising information, the importance of "collective thinking", and the search for sustainable solutions. To turn the latter two aspects into reality, communication for development has to provide benefits to the community. The community radio, supported by internet and social networks (i.e. Facebook), enabled a certain consensus as regards the relevance of sustainability as the ultimate goal of collective actions. These evidence the efficiency of social marketing. On the last day of observation, Friday, November 16, we followed the debate with Paulo César on economic sustainability, and then interviewed him. Paulo César was the one founders of Editora e Gráfica Heliópolis, which would be the first community publisher and printer in Brazil. Due to this innovative initiative, Paulo César and his team received a grant from Banco Itaú (a commercial bank) to start their work. On the first day of December 2018, ten writers (from the local community and the region, and some ETEC Heliópolis students) had their work published, namely short stories, prose and poetry. This peripheral literature gained an important momentum that can generate lasting change in the life of the people in the community. Paulo César, who had long dreamt of publishing a book and had not found the opportunity, collects reports of friends who were frustrated and who suffered financial and emotional losses in the attempt to have their work published by a commercial publisher. Now, besides having fulfilled a personal wish, he said that the aim of the publisher is to help other writers, poets and people like him, who wish to have their literary works printed, and this at a very affordable cost, matching that suburban reality. Another novelty presented by Paulo César concerns the paper used to print the books. A paper mill donated the material to print the first editions. A detail worth mentioning is that the paper is made from sugar cane bagasse. The production process, according to Paulo César, causes a smaller environmental impact than paper made from pulp.

The last day of participative observation was no different from the others. The interview with Paulo César once again demonstrated the importance of the community radio. The radio broadcasting technology is an instrument of information and cultural encouragement. For social marketing effects, the intrinsic relationship

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[4] Alternate-day travel is a driving restriction used by some Brazilian cities that imposes time limits for private vehicle circulation in urban areas between 7:00 and 10:00 a.m. and between 5:00 and 8:00 p.m., based on cars' number plate.

between communication and sustainable development can be verified. The significant impacts on the multiple spheres of urban sustainability inevitably involve the technological innovation of communication.

CONCLUSION

The research efforts intended to demonstrate the role of a community radio as a modern technological tool to disseminate initiatives and projects towards more sustainable urban practices, be they environmental, social or economic. The community radio provides the possibility of transforming itself and of occupying an important place in the debate about problems of public interest. At the same time, it allows the use of its microphones to amplify the voices of the social actors, legitimizing public actions and making them more efficient.

In the observations made throughout the research, it was possible to identify the pride of the social actors and their satisfaction in disseminating initiatives and actions of public interest by means of the radio broadcasting. This behaviour inevitably evokes the concept of social marketing. Moreover, factors such as raising self-esteem and participating in the solution of problems could also be captured in the enthusiasm and in the knowledge demonstrated by the social actors during the interviews and debates conducted. A common aspect to them all is the will to help other people and to improve the reality they live in. From this perspective, the concept of communication for development can be said to be made present throughout the whole radio programming schedule. This finding is particularly important, since the community status of the radio makes it a democratic instrument, a driver of collective actions. Communication via radio is, therefore, a way of amplifying voices and of boosting experiences, in an attempt to engage and to stimulate an increasing number of people to produce changes in people's mentality and behaviour. Lastly, the social marketing strategy and the concept of communication for development applied to the local context may help with this difficult, yet necessary, task of generating positive and lasting transformations.

Throughout the week in which the research was carried out, the programme "Bairro Educador", which used to reach an average of 500 people, jumped to an average of one thousand internauts. The programme that reached the largest number of people on the Facebook page, with 2,959 listeners, was the interview with Jorge Von, who addressed urban mobility. Furthermore, the programme recording had 509 visualizations. José Genário, who discussed the solid waste issues and the problem of community trash, was heard/seen by 285 internauts via social media (Facebook). The activities recorded on the social network show the interest in sustainability themes. Moreover, the enthusiasm of the interviewed actors, as well as the expressive boost in the number of listeners, indicate a significant range of possibilities of broadcasting, now powered by new technologies, which allow for major social transformations for the benefit of the communities.

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Web 2.0 tools as framework for participation and co-creation

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Abstract - *Web 2.0 has brought a plethora of new tools (such as Twitter, Facebook, Instagram and others) and new functionalities, for instance, the ability to co-create web content. The question that is being asked is whether these applications and online tools can be used as an alternative to non-electronic tools for participation in spatial planning processes. The co-creation process that these tools enable is also participation. Participation in urban planning is an important part of space planning that we share with different users of planned space. The chapter shows how the theory of participation can be associated with participatory methods that are used in spatial planning. And how to use them when choosing and creating electronic Web 2.0 tools of. However, to make the use of electronic tools easier for non-professionals from the field of Information and Communication Technology (ICT), we have selected electronic tools designed for collaboration and participation to be integrated into a generative web framework. Various electronic tools are described in this chapter, with different ways of using in the processes of participation and co-creation. One tool that was developed for the needs of a certain European project from the field of integration of local initiatives in revitalizing urban public spaces of contemporary cities and could be used for other similar purposes will be described in more detail. An analysis of the tool used and the responses of those who used it will also be presented.*

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INTRODUCTION

Web 2.0 was first introduced in 2004 by O'Reilly (2005) and Dougherty, representatives of O'Reilly Media Publishing, as a concept that captured the emergence of new web pages. According to Berners-Lee (2006), Web 2.0 is not different from Web 1.0, which in its principle put forward connections between users. Web 2.0 enables writing, which is basic for the participation of users and the development of social networks. Of the same opinion is Shuen (2008), saying that Web 2.0 is not about technology, but about web tools that enable people to work together, build and share information, experiences, photos and similar. Also, according to Alexander (2006), Web 2.0 is not a new discovery but is labelled as a mixture of similar technologies, useful on the Internet. Among them the »social« software application stands out as one of the main components. The term »social« means software that enables users and web developers or providers to make web pages more accessible to a wider range of users. Anderson (2007) similarly states that concepts like »cooperation«, »contribution« and »community« are present on the Internet daily and are part of a social network that is emerging »before the very eyes« of web users. This kind of network needs technologies that transform these concepts into web services and applications we use on the Web.

O'Reilly & Battelle (2009) in their special report "Web Squared: Web 2.0 Five Years On" claimed that Web 2.0 is all about harnessing collective intelligence. Applications that enable collective intelligence must manage, understand and be able to process massive amounts of user-generated data in real time. Moreover, this is all the result of the mobile phone revolution from simple mobile phones to smartphones. Featuring integrated sensors (GPS, camera, microphone, heart rate and accelerometer) and many more sensors as add-ons (like sensors for measuring temperature, humidity etc.), smartphones can collect a vast amount of data in real time. The Web has moved from our desk computers to our smartphones, and the scale of participation has increased exponentially. Thus, in the case of massive external capture (Crowdsourcing), users or the public become human sensors that collect data, information, ideas and make suggestions (Chud & Artigas, 2015).

With their applications and their sensors smartphones can help collect the knowledge of the crowds. Crowdsourcing is a relatively new concept, first mentioned by Howe (2006) in Wired magazine. Crowdsourcing is described as a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity and number, via a flexible open call, the voluntary undertaking of a task (Estellés-Arolas & González-Ladrón-de-Guevara, 2012; Pedersen et al., 2013). Crowdsourcing is a model capable of aggregating talent as well as reducing the costs and time to solve problems, and it is enabled only through the technology of the Web and its Web 2.0 tools (Brabham, 2008).

Participation and co-creation in spatial planning processes are often restricted to techniques and tools that do not have any connection to the Internet. They are non-electronic tools, they are used at workshops, and public releases of plans prepared by planners or investors who want to find out public opinion on these matters. In the work "The Community Planning Handbook" Wates and Brook (2000) describe those techniques and tools (for example, photo survey, mapping, user groups etc.). The question that arises is whether the aforementioned techniques and tools can be implemented with the help of the Web 2.0 tools, thus enabling the public to co-create public open spaces or participate in urban planning also through the Internet successfully. What are these tools? If they are united in a single framework, are they therefore more accessible to the public for the purposes of co-creation and participation and will they reach more users than non-electronics tools and techniques? It is assumed that more creative public participation and co-creation could be ensured with new tools, emerging (daily) on the Internet. If the public were to be invited to help co-create open public spaces, they could bring suggestions, ideas and knowledge about those places in the community they live and work in via the internet. In many cases this could facilitate work for planners while at the same time drawing a less negative response from the public.

THEORETICAL FRAMEWORK

Participation

Participation in planning processes is a topic that has been discussed in many scientific fields. Pioneer in participation research, Arnstein (1969: 216) believes that "the idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you". Moore & Davis (1997: 5) are also very colourful in depicting the perception of people and their understanding of surroundings with an old Chinese proverb: "Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand". There are many theories of participation, and they address different types of participation (Arnstein, 1969; Waidemann & Femers, 1993; Roche, 1997). Waidemann & Femers (1993) presented a type of participation ladder based on the amount of information accessible to the public (Fig. 1). This framing of the issue claims that the level of participation increases with the degree of public access to information. The more information is available to the public, the greater is their role in participation and their decision-making power.

From the perspective of information, technology-supported spatial planning, Waidemann & Femers's participatory ladder is useful because participation levels are associated with information access. Therefore, it is the information in a specific process that is crucial for participants, and technology can make that information more readily available. Participatory models aim to enhance the power of individuals so they can influence decisions regarding their life. From the spatial planning point
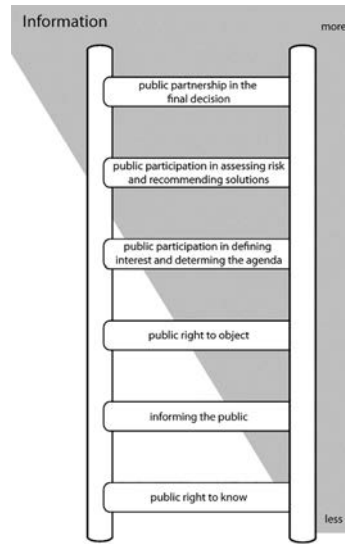
Fig. 1: Public participation ladder, after Waidemann & Femers (1993)

of view, Waidemann & Femers's scale is the most appropriate. In this scale information and accessibility of information stand out as does, in the case of spatial planning, information about spatial interventions.

Co-creation

Co-creation involves people in more active participation dealing with public spaces. Among examples of such co-creation, two can be named: the so-called DIY urbanism and urban guerrilla movements. Examples include graffiti, parkour, yarn bombing and guerrilla knitting, seed bombing and guerrilla gardening, dîner en blanc, and Park(ing) Day (Foth, 2017). And co-creation has many multiple benefits, from generating useful information, creating a feeling of co-ownership, and building healthy relationships. Its benefits are increasingly apparent in many disciplines. The sciences have recognized the value of co-creation for co-ownership of information and social capital, particularly for locally contextualized work (Rock, McGuire & Rogers, 2018). Because the challenges and risks are also well identified, workarounds will be evolving simultaneously. Is co-creation more than participation, is a question that Katrin Prager (2016) poses. She considers that both denote a process that involves active doing; both involve a collaborative process in which diverse stakeholders take part and both involve participants learning from each other. However, participation has many forms and not all forms of participation are appropriate for co-creation. The main difference, according to her, is that co-creation does not stop at actionable knowledge and it also requires practical outcomes. For example, co-creation is not only developing a joint action, but it also involves implementing it; in other words, it is not agreeing to redistribute funds, it is actually redistributing them.

Web 2.0 Tools and HTML5

As we have ascertained, one of the most important novelties deriving from the concept of Web 2.0 is that users are adding data to the web and so co-designing web pages. By this, the administrators/owners of pages retrieve information about users, their knowledge and expertise that could be used for various purposes. Users can, therefore, participate or co-create, and owners gather knowledge from the crowd by crowdsourcing. Participation is enabled by web services and web applications. The basis for creating services and applications is a group of technologies by the name AJAX (Asynchronous Javascript and XML) (Anderson, 2007). Among basic services or tools that have emerged with Web 2.0 are blogs or weblogs, wiki pages, podcasts and video blogs, RSS protocol (Really Simple Syndication), beginning of tagging (tags), social bookmarks, social network services and web library (Alexander, 2006; Kolbitsch & Maurer, 2006; Anderson, 2007).

In the following paragraphs, the basic Web 2.0 tools are described:

Blog or weblog is a diary on the Internet. It is based on the subjective presentation of contents and expresses the personal opinion of an author. It allows reader comments that the author responds to. An author can label entries with tags. This enables faster search through similar tags (Anderson, 2007). So, publishing blogs and commenting enables communication or expression of opinions by author and writers of comments (Benkler, 2006). A blog could be used to present an official stand of a planner or an expert opinion on the matter that the public present to planners or stakeholders.

Forum is a web 2.0 tool that enables the public to talk about everything in order to exchange opinions with experts, decision makers, stakeholders and planners. One such tool is an OPUS local online forum (Staffans, Rantanen & Nummi, 2010). OPUS forums are a web concept where local knowledge, information and data are collected, analysed and transmitted. Forums are a learning platform where knowledge about the use of local land and development projects are interconnected. Forums offer a platform for partner projects and cooperation to local service providers, investors and planners.

Chat or Online chat refers to communication over the Internet that offers a real-time transmission of text messages among users of chatrooms. Such text messages are generally short in order to enable other participants to respond quickly. Participating in a chat provides a feeling similar to that of a spoken conversation (as in a meeting), which distinguishes chatting from other online communication such as Internet forums and email. The conversation can be recorded and later used as a meeting record (Carver, 2003).

Wiki is a web page prepared by one user that allows other users to add content, like the co-creation of a dictionary. The concept of wiki pages is that they enable fast and simple editing of web content by a collaboration of users, which means

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that a user inserts a text, another one edits it and yet another one complements it, etc. (Ebersbach & Glaser, 2004). Wiki pages could be useful to clarify certain terminology in urban planning and to explain processes. But there are also numerous questions about co-creation, e.g. what happens if an author of the original text does not agree with further corrections and how to protect intellectual property (Lamb, 2004), and not least, the question of the open nature of wiki pages.

Tags are keywords, pinned to information, for instance to a photo, video, file or news. They contribute to a better description of information and an easier search through the web. Any user can pin tags to information and create his own list of tags or share them with other users (Högg et al., 2006; Maness, 2006; Anderson, 2007). Tags are useful to check on public opinion. For example, a solution for a new open place or the redesign of the park or town square could be published on the web and enabling users to express their opinion by pinning tags (like, 'don't like' and similar).

A **podcast** is similar to an audio diary, usually for recording lectures, interviews, radio shows, etc. On the other hand, videoblog is a recording of a similar kind, but for videos. Sound podcasts and video podcasts are very appropriate for presenting educational themes (Rogers, 2005; Anderson, 2007).

RSS protocol is intended to automatically disseminate data from web pages to users. This means that a user of RSS protocol does not have to search over and over again through web pages for information; rather he uses the installed RSS reader on the computer and subscription to a web page he wishes to receive information from (Anderson, 2007). The advantages of RSS protocol are that it automatically receives contents from RSS provider and thus allows users to concentrate on reading without wasting time searching web pages for new contents. It is also useful to report on events and procedures.

Web Geographic information system (WebGIS) is a group of tools that enables the presentation of spatial plans together with various specific maps (satellite images, plans of town infrastructure, three-dimensional objects, etc.). With Web 2.0 tools, GIS systems have allowed users to collaborate by drawing and adding spatial data to already prepared maps.

Web-based survey is a research tool that enables researchers to collect data from a variety of research fields, including public open spaces, urban planning, mobility and nature-based solutions, among others. Web-based surveys are faster and simpler than paper or e-mail surveys, the data collection period can be shortened as all the data is collected and processed almost at the same time. Questions of the web survey can have a pop-up help on the matter, and they can show errors to the respondent. The web-based survey is a consulting technique that provides means for planners/developers to gain feedback on proposals

in ways that do not necessarily require citizens to attend a conventional public meeting (Jones, Layard, Speed & Lorne, 2015).

Social network service (SNS) or online social network is an online platform which enables people to build social networks or cultivate social relations with other people who share similar interests or activities. The networking functions of SNS serve to foster social relationships amongst users within the online platform. They provide functionality for building and maintaining the social network graph. The data functions are responsible for the management of user-provided content and communications amongst the users. Their variety contributes to the enhancement of users' interaction and makes the platform more attractive (Paul, Buchegger & Strufe, 2011).

In 2014, World Wide Consortium (W3C) agreed on a new standard for HyperText Markup Language (HTML), called HTML5. Together with HTML5, they also introduced two other renewed standards: one for styles of web pages - Cascading Style Sheet 3 (CSS3) and one for Document Object Model (DOM). With those three technologies and Javascript, designers and programmers can now make mobile applications that can work on any web browser that supports HTML5 and on any device (desktop computer, notebook, tablets and smartphones). The most innovative features of HTML5 lie in its multimedia elements. Programmers can now use those elements (audio, camera, geolocation, local storage etc.) with ease and they can simply capture, for instance pictures from smartphone or conversation from a tablet or even geolocation from a desktop computer (Gutiérrez, 2017). With those new HTML5 elements, programmers are able to produce a completely new variety of apps for crowdsourcing, participation or co-creation that can be used on any platform (MS Windows, Linux or IOS) and on any device (desktop computer, notebook, tablets and smartphones).

METHOD

The research combines the theoretical study of participation and participation tools for community planning, co-creation, crowdsourcing and Web 2.0 tools from the literature to form a scientific base for practical work. Münster et al. (2017) stated that many offline participatory tools can be assisted by digital tools and that digital tools can be used instead of offline tools. The ideas of converting non-electronic participation tools to electronic ones was verified by using a working participatory system and making a working prototype tool to be used in a case study. Prototyping is a way to test a program or a tool. It is a real thing, not a design idea or concept. Moreover, as a real product, it can be tested, altered, and tested again until it meets the original idea or design (Warfel, 2009). The working system that has been used was the generative framework of various Web 2.0 tools that can be selected for various participation scenarios or co-creation tasks. The system has also various software components to enable programmers to make additional tools. So, methodology can, therefore, be regarded as action-research.

The first step in the action-research was the definition of the necessary tool for carrying out the task. The next step was to investigate which software components make it possible to create a tool in the framework of the generative platform. The last step was to make a prototype tool and test it on a task within a certain EU project. This way, information was gathered on the kind of data that could be collected with the tool, how difficult it would be to make such tool, its usefulness, manufacturing errors and the extent of possible participation when used in a real environment scenario. And finally, information could be gathered on the public's responses to the tool.

ANALYSIS AND DISCUSSION

Spatial planning is a procedure that requires the inclusion of the public; acquiring initiatives and proposals that trigger the procedure of preparation or corrections to master plans and also forming standpoints in the matters of proposed solutions in public displays. Increasingly important is the use of the "wisdom of crowds" in planning — the knowledge and the sensibility the public has about their local community, where they live and in which they play an active role. On the other hand, planners in general see participation as an obstacle, not realizing the benefits to be had by using this knowledge. In most cases, one of the main problems is that harvesting public knowledge is a time-consuming and expensive process. Workshops have to be organized, questionnaires and other means of acquiring data prepared. Planners prefer to work and decide on the basis of expert studies that communities have had made prior to master plans. However, even this is not a rule. Crowd-sourcing or mass outsourcing is one of the correct models to be used in urban planning participation because it combines the synergy, knowledge, views, and experiences of the crowd involved. At the same time, in the right circumstances the crowd is smarter than its smartest individual (Anttiroiko, 2015). In the aforementioned work "The Community Planning Handbook" (Wates & Brook, 2000) there are many useful methods that use various tools to gather the knowledge of the crowds, but they are all non-electronic. The book proposes that those tools can be used by planners or local community to organize workshops, field trips, simulations, design fests, etc. Award schemes, briefing workshops, choice catalogues, design games, (see Fig. 2) are some of the tools that can be transformed into Web 2.0 tools. Some of them (different versions of blogs, forums and chats programs, various types of Web GIS programs, many different ways to create web surveys etc.) can already be found on the Internet in abundance, and they can be used instantly on web pages, while other more complex ones are not immediately available and have to be designed. With those Web 2.0 tools the knowledge of the crowds can be captured as well as with the above-mentioned non-electronic tools.
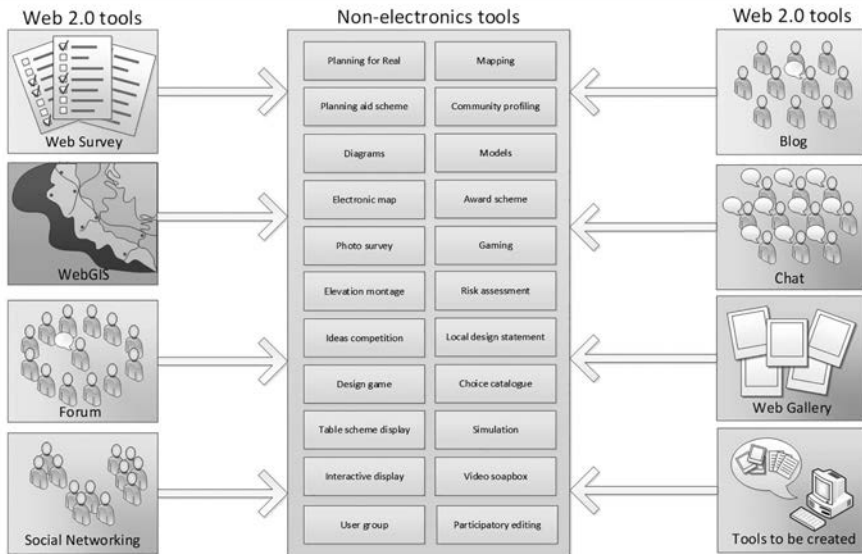
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Fig. 2: Non-electronic tools can be converted into Web 2.0 tools. Source: Author.

According to a study on Internet usage in the EU in 2018, 87% of households have access to the Internet, with Internet daily usage frequency of 72% of individuals. Of all the EU individuals, 67% have used a mobile phone to connect to the Internet. In 2018, 56% of all EU individuals participated in social networks (creating a user profile, posting messages or other contributions to Facebook, Twitter, etc.) at some time (Eurostat, 2019). This indicates that more than half of the active population that could participate in procedures of spatial planning has access to the Internet, knows and uses some form of social networking tools and accordingly has greater ability for active participation. By using social networks in their current form, individuals are better qualified to access Web 2.0 tools. This was one of the bases for creating a generative platform for public participation.

Examining classical methods for harvesting public knowledge and learning about local communities has shown that certain methods can be simply translated to an electronic form and simultaneously used in the generative framework for public participation. In the same way that web GIS can be used as a substitute for a charting method or as an electronic map, that elements of social networks can be used as user groups, and that forums can be used as interactive displays or table scheme displays, photo galleries can be used instead of photo analyses or elevation photomontages. If urban planners want to use the bottom-up approach and use the knowledge of the masses, they should capture it by using Web 2.0 tools. Web 2.0 tools have the ability to support the collective knowledge of the masses due to their democratic, decentralized nature and the diverse functions they enable (Anttiroiko, 2015).

The generative framework of Web 2.0 tools for public participation was developed as a research project at The Urban Planning Institute of the Republic of Slovenia (UIRS). After initial tests, it was deployed on the UIRS infrastructure. To operate such framework, the UIRS has a specialized staff of professionals and experts in the fields of spatial planning and ICT, which can provide all the necessary infrastructure and knowledge for the support and further development of the framework, as well as all the necessary expert knowledge on spatial planning to provide the framework with a repository of expertise. The repository helps users learn about basic terms regarding urbanism, as well as processes and procedures regarding spatial planning. The framework is used in various projects, one of which being Human Cities (EU program Creative Europe). One of the tasks in the project was to give the public an opportunity to share photographs of their neighbourhood online (Nikšič, Goršič & Tominc, 2018). A kind of gallery of pictures had been created, but it was necessary to complement the pictures with photographers' comments regarding them. In other words, coupling a gallery with a survey. A photographer was asked to answer a few questions (what the picture represents, what the photographer wanted to say to the public about the motive, etc.). So, each photography was fitted with attributes that had been gathered via an online form, guiding contributors through relevant questions about their contribution (theme, photography atmosphere, other information about the neighbourhood). All uploaded photographs had been put in a web gallery of the project and were later evaluated by a jury, awarding best contributions as some sort of stimulus for participatory.

For that task, the experts from the UIRS had created a new project package and interface within the generative framework and executed the programming. Within that project, they made a sub-portal with gallery tools, an additional tool in the form of an online questionnaire (Fig. 3) and another one for picture evaluation (Fig. 4). The tools were made using HTML5 language, Bootstrap 3 framework and Razor script. All those programming tools have become an integral part of the framework and can be used for further programming new tools. The sub-portal was set up in a few hours, new tools added in a week. The questionnaire within the tools enabled the public to take pictures with a mobile device or tablet or, if they have pictures on the notebook or desktop computer, to simply upload them from that device. The tool is programmed to add spatial coordinates automatically if the device was able to provide them. Conversely, the user was asked to enter the street name and neighbourhood which was then translated by Google Map services into spatial coordinates. Because users contribute pictures in five different sections, the jury tool was also divided into five categories. Each jury member ranked the top three pictures with 5, 4, or 3, 5 being the best. The tool then added all the scores and in the end showed the winning pictures in all five categories.

During the two-month phase of the photo story contest, 172 pictures were collected from 79 users. There were 52 different neighbourhoods presenting

Fig. 3: Mobile device screen capture from the online questionnaire for the EU project by UIRS. Source: Author.
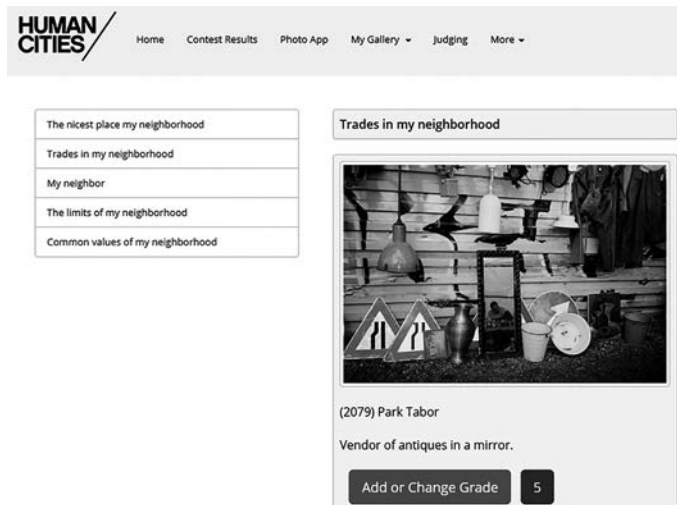
Fig. 4: Tool for jury/competition task. Source: Author.

pictures in five different descriptive categories. During the time of the photo story contest 675 users visited the web page, making 1,183 sessions, and 2,859-page views with a 62% bounce rate. In 1,183 sessions, 74% of users accessed the web page from desktop computers, 22% from mobile devices and 4% from tablets. Out of 79% users,

5% were younger than 14 years of age, 27% were between 15 and 24, 33% between 25 and 34, 19% between 35 and 44, 7% between 45 and 54, 7% between 55 and 64 and 3% older than 65. Participation by gender was divided into 32% males and 68% females. Among them were 41% were still in school, 43% were employed, 8% unemployed and 8% retired. There were no major problems with the use of the questionnaire tool exhibited. It was concluded from the statistic that people still prefer to use desktop computers over smartphones and tablets. The majority of them was 15 to 44 years old. There were some problems with on-site registration, especially by elderly users (65+). The registration consisted of an on-site registration form and confirmation of the registration by clicking the confirmation link in the return e-mail from the site. Some of those return e-mails had ended in the junk mail folder, and many elderly people were not aware of this or could not find it. But overall satisfaction with the questionnaire and the tools for the jury was good. The users were also asked to express their opinion on the portal. The prevalent answers were that with some minor modifications the tools are useful for many different tasks involving capturing and evaluating pictures for the competition.

CONCLUSION

The concepts were confirmed by building a prototype tool that had been proven so by the analysis. Because the tools' software environment is flexible, it is possible to adjust the tool according to various questions in the survey. The use of the generative framework and the tool had shown that it was reasonably easy to set up a participatory system by enhancing a planning project with social tools. The framework with its tools can assist a bottom-up civil initiative as well by creating a web-based platform that includes open public information. The advantages of this framework are mostly in terms of flexibility as well as the ease of developing, adding and upgrading those tools in the future. The framework's flexibility and extension potential are possible because the framework combines the theory of participation with the theories of information systems and social media tools. The framework and its tools are versatile enough to perform different tasks for collecting public opinion and knowledge about the public open spaces and co-creation of those spaces.

The power of the Web 2.0 tools lies, among other things, in the co-creation taking place among their users. Co-creation could be named participation with a concrete result. In the presented case, the photographs and the results of the completed survey became input data for the planners of the open space in the neighbourhood to make it more pleasant to its dwellers. Users of Web 2.0 tools can participate with their opinions in the problems of open space, by choosing the offered solutions, or by offering better solutions, etc. Insofar as their proposals and solutions are taken into account in the final implementation of the project, this means that they have co-created the open space (Daiberl, 2017; Parmentier & Rolland, 2013; Nandi & Mittal, 2014).

There are many questions that can be asked when preparing for participation and co-creation, such as: how to reach and involve public representatives, how to involve and activate the public to cooperate from the start of the project, how to present a project in an understandable way, and how to organize participation or co-creation for the sake of users. Some of those questions can be answered with various communications channels between planners and public. Communication can be either one-way (e.g. advertising, media, direct mailings) or two-way (workshops, boots, website, apps, social media etc.), physical or electronic (virtual). But only two-way communication can provide participation and co-creation; on the other hand, one-way communication can be used to convey information about the project to the public at the earliest stage of the project (Münster et al., 2017). By using the generative framework and its tools, users will leave digital trails in the framework. And those digital trails, which include suggestions and ideas of public open spaces, will lead to "big data" on people's perception of space. This will present a challenge for researchers who wish to study them. Still, grasping this will lead to a better understanding of public spaces and will help to shape the environment in which we live in.

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Planning of public open spaces with digital tools. The example of the WAY CyberParks

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Abstract - *The aim of this chapter is to discuss how digital technology can assist public open spaces' planning processes. It is centred on the opportunities that digital technology offers to aid spatial planning, by introducing the monitoring tool WAY CyberParks, developed and tested within the CyberParks Project. This digital tool intends to increase information and knowledge about places in order to create more inclusive public spaces that correspond to the needs of their users. The digital tool, developed to monitor how people use public spaces and as an exchange interface between users and planners, increases the understanding of users' needs and preferences. The challenge is to attract users to engage with the app during their visit to public spaces and define the number of users required to obtain a representative sample. One of the main objectives of this digital tool is to allow strong public participation, therefore users' opinions should be representative. As a result, WAY CyberParks intends to be a tool to be used by planners in the co-creation of public spaces. The analysis of the tests of WAY CyberParks in Lisbon serves to demonstrate the features of this tool and the type of data gathered. This chapter makes an analysis of the strengths and weaknesses of this tool, and the advantages of using digital tools in the processes of planning and co-creating public open spaces.*

Keywords - Public open spaces, WAY CyberParks, digital public participation, co-creation of public open spaces, urban planning

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INTRODUCTION

This chapter analyses how digital tools can be used to increase public participation in public space planning. It is not a comparison between tools and their usability, but rather a discussion about some results obtained in the scope of the ongoing research work for the doctoral thesis "The importance of digital tools in the co-creation of public open space - the case of WAY CyberParks," developed by Tiago Duarte. The research aims above all to critically analyse the potential of a specific tool, WAY CyberParks. This tool was developed under the COST Action TU 1306 CyberParks, which fostered knowledge about the relationships between people, ICTs and public spaces, supported by strategies aimed to improve their usability and attractiveness. CyberParks was established as an interdisciplinary research platform that included the collaboration of different working groups to understand the relationship between ICTs and the production and use of public open spaces as well as their relevance to urban development. The Way CyberParks is developed by DeustoTech-Mobility in Bilbao and tries to respond to the needs of researchers and planners to collect the "feelings" and contributions of people in creating better public spaces. Throughout this chapter, a brief description of WAY CyberParks will be given, in order to demonstrate its potential. The results obtained in a workshop carried out in the Mouraria neighbourhood in Lisbon are considered and analysed. Finally, conclusions about the advantages of the use of this digital tool in the process of co-creating public spaces will be presented.

With the opportunities created by digital tools, it is important to understand if they can replace the traditional methods of public participation. Bearing in mind that public spaces play an important role in the interpersonal relations, for friendship and sharing of knowledge and experience (Gehl, 2017), it is useful to rethink urban planning in terms of a more participatory and inclusive perspective through digital tools. From this perspective, the production of public spaces should encourage and enable people to actively participate in the planning process, from the development of a concept to an action plan or to the maintenance of the place. The "New Charter of Athens", revised in 2003 (Conselho Europeu de Urbanistas, 2003), refers specifically to the use of new information and communication technologies (ICTs), arguing that cities should be physically and virtually connected. Furthermore, the Charter argues that technological developments in communication, information and transportation should benefit citizens and the city as a whole. Currently, our society is organised around technological developments, generalised internet access being an example. The new means of communication have greatly changed the quantity, quality, and speed of information transmission. Associated with a general scarcity of basic information in urban planning, the new digital research forms enable a better understanding of the territory (Frota, 2015).

THE WAY CYBERPARKS DIGITAL TOOL

Nowadays it is quite common to see people using digital communication devices, such as smartphones and tablets, in public spaces. Among other things, these devices enable them to send and receive calls and emails, to take pictures and make movies, for entertainment and leisure (reading or play) and socialize (interactions). Our day-to-day life is endowed with instruments that allow us to access quickly, and in a relatively easy manner, information that would otherwise take more time to obtain. It is through the use of these new tools that a challenge arises for the different experts interested in the production of urban spaces, namely, to increase the knowledge about how to promote these new forms of communication as tools to support decision making in planning, producing and maintaining public spaces (Smaniotto et al., 2015). These new forms of interaction can facilitate the collection of data about public space users, i.e. data to identify people's opinions and needs regarding such spaces, contributing to the adoption of creative solutions and/or forms for maintenance of spaces that meet people's needs. In order to follow this path, it is necessary to equip the digital tools to carry out this task meaningfully. Having better knowledge of the spatial needs/preferences of users can aid the finding of solutions that are capable to increasing the quality and usage of public spaces.

It is also important to compare different research methods (traditional and digital) and evaluate their merits and drawbacks, i.e. paper- or web-based questionnaires or interviews. The possibility of collecting data faster, as well as greater independence of the respondents, with more privacy, without anyone conditioning opinions, are great advantages. Also, smartphones are becoming user-friendlier, so that people can be approached to share ideas and opinions about urban space in entertaining and/or informal ways. In addition, given the current challenges posed to the urban society, i.e. time scarcity for leisure, social exclusion of specific groups (e.g. seniors, immigrants, etc.) to mention only a few, it is essential to create spaces that not only bring more people outdoors - to an open and healthier environment, but also that such contexts be more inclusive and fit users' needs better, for example, countering people's tendency to stay indoors, often connected to a virtual world but not to the real city. Summing up, we must strive to find answers to the question, as put by Thomas (2013) how "can we capitalize on our newly discovered love for wired-life to encourage more people to go outside and use the city?"

The Digital Tool WAY CyberParks allows researchers to inquire into the perceptions of public spaces. It consists of three main elements: a mobile application for smartphones (app), a set of web services, and the cloud. This tool is part of the broader research programme WAY (Where Are You?) of DeustoTech-Mobility (Bilbao) which proposes to develop mobile applications to continuously support people's location and orientation, regardless of the environment. WAY CyberParks

was tested in several countries associated with the CyberParks Project. In Lisbon, this tool was applied in different contexts in the Quinta das Conchas Park, in Príncipe Real Square and in the Mouraria neighbourhood. Studying these places in Lisbon is part of the above-mentioned doctoral thesis. This chapter focuses on the results obtained in Mouraria.

The application, available in IOS e Android versions, offers its users some services: obtaining information about a space, previously loaded and made available by points /places of interest; visualizing their own position and the location of the points of interest by real time map navigation. This latter feature is common to many applications, but in WAY CyberParks it is enhanced by the possibility of including quizzes, whit questions arising in specific locations. The tool also provides a suggestion box, where a user can freely upload an audio, image or video file and/or make text commentary, making it possible to collect geolocated information, opinions and perceptions. On the Android platform, a virtual reality service is available, and it is possible to include three-dimensional virtualised elements, allowing the visualization of equipment proposals to be placed in the public space, as well as gather opinions about them. It should be noted that the application can be used online or offline; the latter involves the need to upload the information collected to the web platform when the application is connected. In the offline mode, some features have limited functionality.

The web platform enables different types of information generated by the app to be analysed, such as the real-time position of users and their routes, also in terms of their duration and distance, the weather conditions, as well as users' suggestions and responses to questionnaires. The transmission of information between these two elements (mobile application and web platform) is performed automatically through the cloud. The potential of the system results from the combination of the mobile application (app) - more directed to the user - and the web platform that hosts the database which allows data to be collected, stored and read, as well as information - more targeted at the investigator/planner – to be uploaded. The web platform, where the collected data is stored, enables different types of analysis - global analysis and/or by type of information, such as by user profiles, by date, time or period of the day, weather conditions, as well as the analysis of suggestions and answers obtained. In the case of users, as they fill out a profile form when they first access the application, the analysis can be done by age group, gender, schooling level, training area, profession, place of employment and residence.

The WAY CyberParks app enables planers to obtain the opinion of different users on specific issues related to a public space. The advantage of an application of this nature is related to (1) real-time data gathering, (2) maintaining an updated database, (3) capturing the different users' activities in the same space, and (4) recording their opinion, via geolocated texts, videos or images. The analysis of the collected information through the mobile application enables planners to obtain better

knowledge about the use of the space, as well as users' opinions and suggestions regarding said space. The quality of the collected data contributes to enhance scientific knowledge and to improve methodologies of participatory planning. At the same time, it helps to enrich planning practices and policy making – now more grounded on people's interests and needs.

WAY CYBERPARKS WORKSHOP - AN EXPERIENCE IN MOURARIA

On June 15, 2017, as part of the European Researchers' Night and in the scope of activities prior to the event, the workshop entitled "WAY CyberParks app – Science in Lisbon", organized jointly with the CyberParks Portuguese team, took place in the Mouraria neighbourhood. The main objective of the workshop was to test the WAY CyberParks app, using a new location. The results obtained were processed, analysed and presented at the event. The workshop was attended by 20 participants who, in groups, used the app. Prior the workshop, some preparation tasks had to be carried out, i.e. the delimitation of the area to be studied, defining and locating questions that we would like to have answered, as well as adding the places of interest. The placement of this information was based on site visits for its analysis.

The workshop started with a short presentation of WAY CyberParks, and its purpose, as well as of the CyberParks Project. The participants were informed about the area covered by the workshop / app test, which did not correspond to the entire area of Mouraria, due to the limited time available. The participants were told to use the neighbourhood in the same way they would normally do, and to extensively make use of the suggestion box. The purpose of this workshop was to test the WAY CyberParks app and its functionalities and to take advantage of the opportunity to participate in the European Researchers' Night, in order to encourage greater dissemination of the project and of the digital tool. The data collected are as follows: 1) Track of each user's route(s), 2) Information uploaded in the suggestion box, 3) Answers to a questionnaire on the space visited, and 4) Paper questionnaire on the applicability and user-friendliness of WAY CyberParks.

In Lisbon, this kind of workshop had been used previously, also within the framework of the activities related to the European Researchers' Night, in Quinta das Conchas Park. Duarte and Mateus (2017) address the results of the app test in Quinta das Conchas. Backed by the experiences and the results obtained, it was possible to establish again more aspects to be improved in the digital tool. Among them, there were some related to the app features, as some small shortcomings had been detected, like for example the way notifications for the questions popped up, and the type of information placed in the PIs. Another issue was the number of questions in the questionnaire, which was considered too long.

This type of research tool needs continuous upgrades, in order to adapt it to the objectives or requirements. In the case of WAY CyberParks, this has been the subject of improvements based on different field tests, such as in Fòrum de les

Cultures and Carrer d'Enric Granados in Barcelona in 2014 (Duarte, 2014), where some flaws were identified. Only with such tests was it possible to bring the app closer to the conditions necessary for effective use and for meaningful data collection.

The routes of each user

Through the use of the GPS receiver incorporated in a smartphone, WAY Cyber-Parks is able to record the route of users (tracking) in a public space. This function increases understanding of how people use the space, which routes they take, the distance covered and its duration. Fig. 1 shows a screenshot of the web-service of WAY CyberParks showing different users and their routes during the workshop.
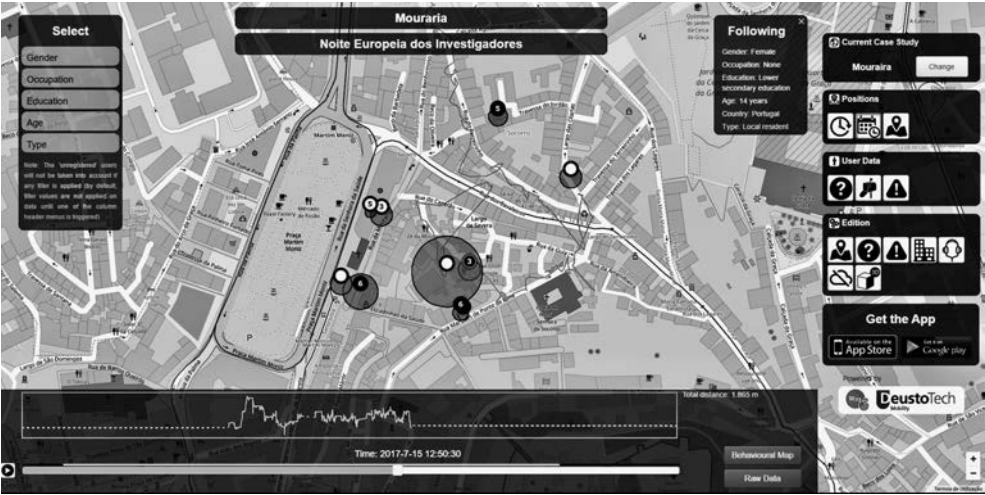

Fig. 1: Screenshot of WAY CyberParks, showing users' tracks and distances covered.
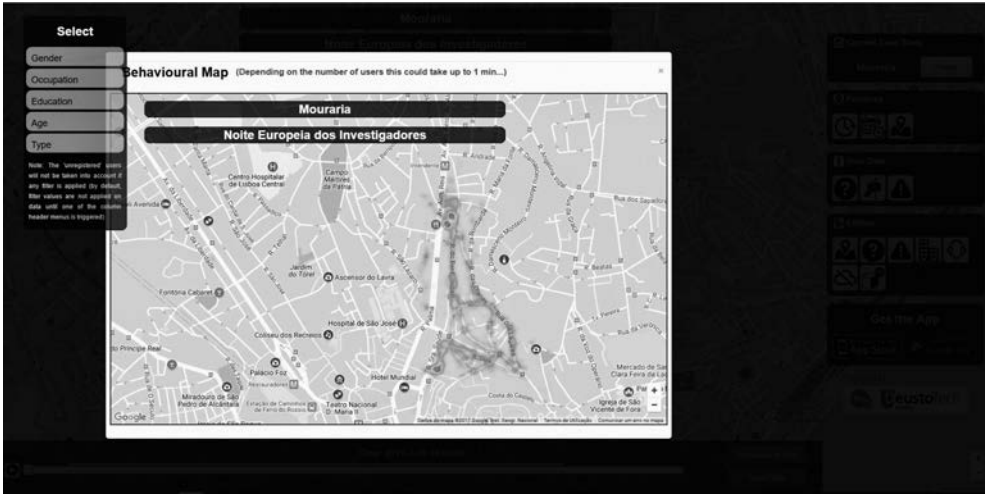Source: http://services.cyberparksproject.eu.

Fig. 2: The behavioural map. Source: http://services.cyberparks-project.eu

On the website, it is possible to see all routes, duration and distances of the journeys of the different users. Since they were included in a workshop, the time limit, distances as well as the range of action turned out to be very similar. The behavioural map (Fig. 2) indicates the places with the longest stay.

However, even with these small constraints, an analysis of the obtained results - to verify the potential of the application - could be performed, as planned. Regarding the features, the findings do not reveal divergences with the outlined objectives, but they reinforce the great possibility of analysing different routes without the need for users to take specific care. It is only necessary for the app to be on.

Information placed in the WAY CyberParks suggestion box

At the Workshop, the participants were encouraged to use this functionality in order to provide suggestions as well as indicate the strengths and weaknesses observed. In total, 61 suggestions were sent, a figure that was very relevant to the number of participants, and these allowed us to gauge the app's functionality. The sound feature was used only once, and only three videos were uploaded. Sending suggestions was done mostly through text and image, and the use of text and image in the same suggestion was the most commonly used option. Fig. 3 depicts an example of a suggestion made using text and image.
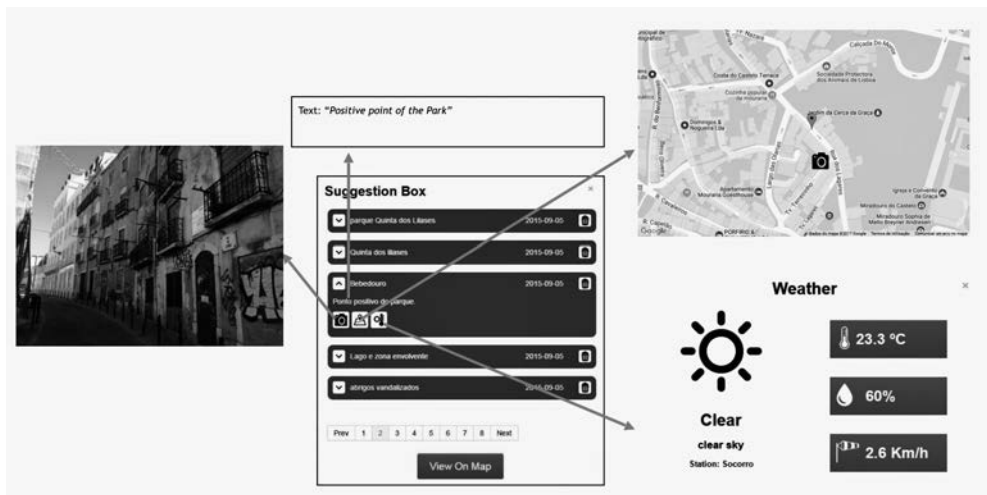
Fig. 3: Suggestion box elements. Source http://services.cyberparks-project.eu

WAY CyberParks follows the trend of geolocation entrenched in mobile applications. For all suggestions sent to the web services, it provides georeferenced data as well as the weather conditions at the time of submission. This functionality has enormous potential, since it allows gathering different opinions, providing their exact location and weather conditions without forcing the researcher to be present in the space. The type of suggestions may be as diverse as possible. In the case of this

workshop, the participants were asked to send suggestions related to the app, as well as identify positive and negative aspects in the urban space. Regardless of the goals, the app is so assembled that it enables getting answers. This is undoubtedly an important feature of WAY CyberParks: being dynamic in order to be able to gather different types of information according to the research needs. This kind of information can be also obtained by traditional research methods, i.e. using interviews and paper-based questionnaires, but the app allows, first, a great number of entries, and second, more relevant, it facilitates the analysis of data. It also allows a more effective response to specific data privacy issues, since the data collected is not personalized, while in traditional research method the respondent is inevitably faced by an interviewer.

WAY CyberParks' questionnaire about the visited space

Another example of a dynamic component of WAY CyberParks is related to the possibility of asking questions about the urban spaces, questions that are automatically displayed when the user is within range of the previously defined. This functionality is an asset in collecting opinions on public spaces and can be a fast and effective way to interact with users. In the Mouraria workshop, the set of locations and the related questions to be put to the participants were defined in a previous site visit. These questions are mostly related to the characteristics of and personal opinion about the urban space. The questions that were asked and that were intended to be answered can be found below.

Question	Location	Answer Options
Did you already know this area?	Intendente Square / Benformoso Street (beginning of the course)	Yes/No
If your answer is 'yes': do you come here often? If not, why not come here before?	Intendente Square / Benformoso Street (beginning of the course)	Open answer
Please state why you chose this route?	Olarias Staircase	Already Known/ Curiosity / Transit / Other / I don't know
What is your opinion about this place?	Mural in Benformoso Street	Rate out of 1 to 5, where 1 is uninteresting and 5 is very interesting
Do you consider the noise level here uncomfortable?	Olarias square	Rate from 1 to 5, where 1 is a bit annoying and 5 very annoying
What do you think of this intervention in urban space?	Corner of the Travessa da Paz (urban furniture - table and benches)	Rate out of 1 to 5, where 1 is uninteresting and 5 is very interesting
How satisfied are you with the sidewalk?	Agostinho de Carvalho Street	Rate 1 to 5, where 1 is unsatisfied and 5 is very satisfied
What is your opinion about Tuk Tuks in Mouraria?	Santo André Street	Rate out of 1 to 5, where 1 is uninteresting and 5 is very interesting
How do you rate the interest of this place?	Square next to the Três Engenhos-Alley	Rate out of 1 to 5, where 1 is uninteresting and 5 is very interesting
Do you think there should be more playground equipment?	Playground on the Capelão Street	Open answer

Question	Location	Answer Options
What do you think about the contrast between the new and the old?	Crossing of Capelão Street and Mouraria Street	Rate out of 1 to 5, where 1 is uninteresting and 5 is very interesting
Which are the 5 highlights of great interest in your route?	Mouraria Street (end of the route)	Open answer
Which are the 5 highlights of little interest in your route?	Mouraria Street (end of the route)	Open answer

Table 1 – List of questions placed in the WAY CyberParks app for the Mouraria Workshop

The content of the questions was very diverse, as well as the possibilities for answering them. For some questions, the opinions could be valued on a graded scale from 1 to 5, others were open, for sending texts or simply typing yes or no. The app enables users to ask questions through existing forms, and the way the answers are to be delivered has to be defined. For these questions it is also possible to define the range of action that meets the planned goals. Only within this radius do the questions pop up to be answered by the user. Fig. 4 shows an example of the results obtained in one of the questions put in Mouraria. It is the question launched at the corner of Travessa da Paz, and it asked participants to give their opinion about pieces of urban furniture recently placed there. The features of Travessa da Paz, with the sidewalk and the street furniture, are shown in Fig. 5. The graphic is generated automatically by the web service. Through it, it is also possible to filter the answers using different parameters such as age, gender, and/or neighbourhood of residence, for example.
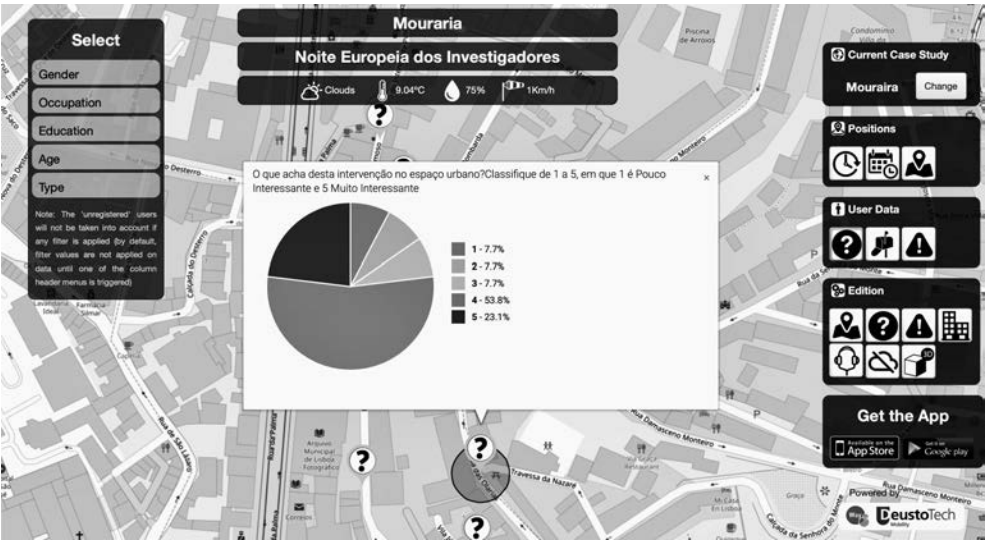
Fig. 4: Answers obtained to the question "What do you think of this intervention in the urban space?" placed at the corner of Travessa da Paz. Source: http://services.cyberparks-project.eu

Fig. 5: Corner of Travessa da Paz. Source: Tiago Duarte.

Selecting the question about Travessa da Paz is linked to a recent urban rehabilitation project by the city council in this street: A set of tables and benches were installed on the broad sidewalk to invite people to prolong their stay in the area. The majority of participants considered this intervention "interesting" and "very interesting", evidencing the positive changes in this place. This question also demonstrated that such a tool can bring enormous advantages over traditional methods, as in paper-based questionnaires it would be difficult to ask such a specific question.

Paper-based questionnaire on the tool WAY CyberParks

Taking advantage of the workshop, a paper-based questionnaire was distributed to the participants in order to get their feedback about the user-friendliness of the app. The questionnaire was handed to the participants at the end of the workshop.

The analysis of the app's functionalities shows that the participants appreciated the questions, stating that they were simple and objective, and that they enable the assessment of the places they reached along of their way. On the other hand, when asked which further questions should have been asked, since in some cases the questions are very general, there were statements calling for more place-specific questions. It should be noted that this workshop aimed primarily to test the app in a real context, therefore, the main concern was not to go deep into the quality issues of public spaces, but rather to use simpler questions to evaluate the effectiveness of the app's functionalities. When asked about suggestions for improving the app (question 4), the respondents provided diverse answers, but some included the request to increase the number of points of interest, improve the speed in accessing the smartphone camera, better adapt the icons to the questions, provide easier access to the points of interest and supply the app map with a guidance

feature. It was also mentioned that the process of submitting suggestions could be made easier and the app's own image improved, making it easier to understand the functionalities behind the buttons.

The participants were also asked whether they had found something new in Mouraria through the use of WAY CyberParks. The answers were positive, as through the app it was possible to discover new streets and places. There were also some participants who did not know the neighbourhood, mentioning that the app was a guide for the discovery tour. In general, with these answers one of the workshop objectives was met: to support visitors in getting to know the place better. This is one of the major differences from traditional methods, as with them it would be almost impossible for people to discover something new. With such a digital tool, people enjoy the possibility of discovering the urban space autonomously, and, should this be the goal, there may be cases where it can be done alone.

CONCLUSIONS

The use of digital tools in the analysis and assessment of public open spaces allows for a new kind of approach to placemaking, facilitating information gathering, making the process faster and more effective, and, depending on the case, more accurate when compared to more traditional research methods (paper-based questionnaires, interviews, etc.). However, just as all research tools, irrespective of whether they are more traditional or more innovative, digital tools have also limitations. For example, without internet connection, most features of the WAY CyberParks app are limited in their functionalities. Since WAY CyberParks is an interactive tool, its usage can play a relevant role not only in the creation of new public spaces but also in the maintenance and improvement of existing places.

Through the features of the app it is possible to develop new approaches to public participation in the process of producing public spaces, with greater involvement from citizens, and consequently with a greater probability of success in the planning process. Certainly, there are still some shortcomings in the tools, as detected in the workshop in Mouraria, but these do not diminish its potential in comparison to traditional research methods. Such digital tools enable researcher and professionals to think about digital public participation, where all actors can become more involved in co-creation processes, and consequently take on more responsibilities in defining the public space more suited to the needs of all.

From the discussed case study and in view of the analysis of the potentialities of WAY CyberParks, it can be stated that the workshop allowed a better understanding of the advantages of technology compared to more traditional research tools. Due to the positive effects shown, such as the ability to be easily adapted to different needs and environments, and respond to different issues, making data collection faster and smarter, technology can be an easy and economical research method.

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The WAY Cyberparks app allows for the accurate and continuous monitoring of individuals, and the data collected are especially rich and meaningful. The next steps are to expand and increase the use of the app in further case studies. This will provide the basis for assessing the relevance of digital tools in understanding the relationship between public spaces and users. Further opportunities will be identified, in order to explore the tool's potential for contributing to the improvement of public spaces by responding to community needs and taking advantage of participatory methods, such as co-creation.

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C3places

C3Places - using ICT for Co-Creation of inclusive public Places is a project funded under the scheme of the ERA-NET Cofund Smart Urban Futures / Call joint research programme (ENSUF), JPI Urban Europe, https://jpi-urbaneurope.eu/project/c3places. C3Places aims at increasing the quality of public open spaces (e.g. squares, parks, green spaces) as community service, reflecting the needs of different social groups through ICTs. The notion of C3Places is based on the understanding that public open spaces have many different forms and features, and collectively add crucial value to the experience and liveability of urban areas. Understanding public open spaces can be done from a variety of perspectives. For simplicity's sake, and because it best captures what people care most about, C3Places considers the "public" dimension to be a crucial feature of an urban space. Public spaces are critical for cultural identity, as they offer places for interactions among generations and ethnicities. Even in the digital era, people still need contact with nature and other people to develop different life skills, values and attitudes, to be healthy, satisfied and environmentally responsible.

The book aims to spark discussion on the co-creation of public open spaces through the active involvement of different stakeholders in the production of a more inclusive, attractive and responsive urban environment. It intends to help researchers, governments and drivers in understanding and implementing more collaborative actions. The authors share experiences, visions and reflections on how co-creation and participatory processes can open up possibilities for a sustainable and equitable future. This book emphasises three dimensions: practice, reflection, and learning. Practice concerns driving actions, identified and analysed experiences that serve as key models. Reflection refers to exploring and examining the results and perform-ances of a co-creation process. Co-creation is not the search for a final product, but rather a process and a new path to more responsive and inclusive communities. Learning refers to the knowledge transfer and replication induced by the synergy of the different actors involved in this book.

The chapters which constitute this work were completed prior to Spring 2020, so the research and insights do not reference the global public health crisis caused by Covid-19. However, in such challenging times the argument for co-creation approaches to increase the potential of public spaces to support a range of inclusiveness outcomes is even stronger.

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