Merging the Physical and Digital Layer of Public Space

The PobleJoc Installation Case Study

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Traditional approaches in public space design tend to bring order and control hindering the creation of expressive spaces that can host and stimulate social dynamics in the neighborhood. The aim of this project is to develop points of disorder, providing opportunities for imagination and spontaneity, by testing the potential of overlapping the digital and physical urban layers. The PobleJoc installation aims to activate the public space enhancing citizens participation and creativity.

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INTRODUCTION-

The city of Barcelona, during the last three decades, has dedicated much work to reshaping its public space, developing, through several interventions in the historic city centre, waterfront and peripheries, an approach known as the Barcelona Model for Urban Regeneration. The Barcelona Model has driven and shaped the transition from the industrial model to the tertiary and leisure city models in the whole of Europe. The city has embraced the potential of technology as a means to once again be at the forefront of innovation. Barcelona was the first city to win the award for European Capital of Innovation in 2014, also known as the “iCapital” of Europe, “for introducing the use of new technologies to bring the city closer to citizens”. This opens the debate on how advanced technologies can help to enhance existing public space, fostering creativity and exchange, as well as citizen participation, both with respect to the design and inhabitation of its spaces.

Traditional approaches in public space design tend to bring order and control hindering the creation of expressive spaces that can host and stimulate social dynamics in the neighborhood. Sennett recommends, in order to surpass the issues related to over control, the development of points of disorder in public space allowing to implement zones of unexpected experiences and activities (Sennett, 1990). The points of disorder become areas of creativity and change (Amin and Thrift, 2002). These points of disorder in public space, through attentive design, can conjoin and allow for the creation of opportunities finally enhancing the urban spatial qualities of the area (Graham and Thrift, 2007). This paper explores how the integration of digital technologies and participatory design strategies can result in the
creation of expressive public spaces and forms of self-organization, enabling the citizens to organize activities and modify their public space according to their real time needs and desires.

THE SUPERBLOCK AS A FLEXIBLE PUBLIC SPACE

Through the implementation of new technological developments urban spatial quality and the related experience within it can be enhanced, providing fertile ground for creativity. In this sense there is potential to transform existing static urban spaces, thanks to the application of new tools, into dynamic spaces that can respond to the citizens’ needs and desires.

Ubiquitous computing allows us to embed technology in our everyday life in such ways that it is becoming an integral part of our environment. Objects are interacting with us, building skins are becoming interfaces and architecture is becoming an evolutionary organism, able to react in real time to multiple agents, such as the environment, time or user needs.

Within the framework of “Active Public Space” (APS), a project co-funded by the Creative Europe Programme of the European Union, under development since 2015, a profound study of the activation of public space has been developed, in particular addressing the relation between public space and new technologies. The Active Public Space project includes several actions, among which the development of publications, workshops, a symposium, and an itinerant exhibition. These activities are developed by the Institute of Advanced Architecture of Catalonia (IAAC), the Centre for Central European Architecture (CCEA) and the University of Applied Arts Vienna (UAAV). As part of these actions, the PobleJoc workshop was held at IAAC between the 5th and the 7th of September 2016, oriented to the development of the Poble Joc installation, to be placed in the Superilla pilot area in the Poble Nou district of Barcelona.

The Superilla pilot is a small scale pilot project of the Superilla plan for Barcelona, developed by Agenzia de Ecologia Urbana, as part of the Urban Mobility Plan of Barcelona 2013-2018. The plan aims at closing two thirds of Barcelona’s roads to traffic, an urgency brought on by the high levels of traffic pollution in the city. This intervention allows to create new pedestrian areas and consequently new spaces for citizens. If implemented, the plan will greatly increase the public space availability in the city of Barcelona and it is therefore an important opportunity to test new principles to design the area. In order to study innovative solutions for this new public space, five schools of Architecture in Barcelona were invited to set up an one-week workshop as well as installations in the area. During the workshop, IAAC students participated in the development of the PobleJoc installation for the Superilla area.

THE POBLEJOC INSTALLATION

The aim of the urban intervention designed by IAAC was to bring new life to this public space and provide opportunities for imagination, spontaneity and social interaction. This was further enhanced by the creation of a dynamic platform, allowing to engage the community and multiply their experience informing them on environmental factors and related events.

The installation included:

- Digitally fabricated furniture modules on wheels, that could be moved by citizens re-shaping the space according to their needs;
- An online calendar for organizing the activities;

Figure 1
Urban Furniture Modules
• An augmented reality application, which could give real time information on the activities related to each furniture;
• A system of drones detecting the movements of the furnitures, which were mapped and projected during the night on one of the furniture modules.

By integrating the digital and physical layers, a new public space which was responsive to the citizens’ needs was developed, creating an unpredictable surprising space constantly shifting and changing.

The PobleJoc installation was designed as an Urban Game. The urban furniture included: a bench incorporating a tree, an urban orchard, a market stall, a ping pong table and a screen, which were all mobile. The elements were sorted with the aim of responding to the following needs: rest and interaction, production, exchange, play, audiovisuals. (see Figures 1 and 2)

The space configurations were also mapped using a drone, in order to extract data on the space dynamics. During the night the data was projected on the screen, offering a new point of view on the public space, revealing hidden spatial dynamics.

As part of the PobleJoc installation, an augmented reality application was developed, which was used to digitally overlay information about the activities and functions of the installation. Using a QR code, the users could download the application (freely available on the Android platform) and use it to get more information on each module of the installation. By pointing their phone cameras to physical markers available on each module, digital information was overlaid on them regarding the program and location of different activities related with the installation, as well as related general information about the city. By introducing this digital layer to the installation, the aim was to provide a second level of interaction, through information and social media.

The following data could be visualized using the augmented reality application (see Figure 3):

- Screen tag: general info on the project; 3D model of the superilla;
- Bench tag: twitter feeds with the Superilla hashtag;
- Pods general tag: info on urban agriculture in Barcelona;
- Pods specific tags (one tag per plant): nutritional value and general information about plants;
- Table tennis general tag: map with sports locations around the area;
- Table tennis specific tags: calories burned, optimum temperature and relevant time of the day to practice sports;
- Market tag: market’s weekly schedule.

The installation aroused curiosity between the citizens and the PobleJoc app was downloaded numerous times. The elements of the PobleJoc installation became for a week empowerment tools enabling people to express their creativity and adapt the public space to their needs.

MERGING THE PHYSICAL AND DIGITAL URBAN LAYERS

Augmenting the physical layer of the urban fabric with the continuously and rapidly growing digital layer of our urban life has been envisioned for decades. With ubiquitous and mobile computing and the recent advancements of available technology, the interweaving of the physical and the digital layers of the urban space is becoming a reality. To-
day, there are numerous applications of Augmented Reality (AR) in the city using smartphone devices. In the domain of design and planning, information and communication technologies (ICT) offer great opportunities in participatory processes as they allow people to better visualize projects and participate in the development process. AR and ICT tools are also applied widely in cultural heritage sites to enrich the experience of the visitors. They are also very valuable in enhancing education and awareness of the public, such as the example of the TunnelVision project in New York City’s subway system. TunnelVision allows users to point their phone at one of the many New York City transit maps and explore city open data that is overlaid onto the physical map. Users can explore city Census data such as income levels by region, real-estate prices, etc. and can also observe real-time data such as the number of commuters entering train stations by activating a visualization of New York’s smart transit data feeds.

The Poble Joc installation tries to not just superpose a new layer of information, but to create a vi-

Figure 3
AR app visualizing Twitter hashtags

Figure 4
Users Participation
brant dynamic between the digital and physical layer, helping citizens to make decisions, share information and leading to new participatory designs and spatial configurations. For example, reading information about the growth of vegetables and their nutritional value people can decide what vegetables to cultivate in the orchard module and where to place it in the public space, according to their solar needs or people can decide to organize activities in the market module, sharing them in the market’s weekly schedule.

This project demonstrates design values central to participation through augmented reality. It is a process which balances the digital and physical channels of communication. It emphasizes the power of experience gathering the local community in a physical space and a virtual space simultaneously and it promotes sustainability and reproducibility through tracking and analysis of the urban fabric. Through our installation, we have managed to engage the public in a participatory design and extract meaningful information on their perception and aspiration of the reclaimed public space. Moreover, PobleJoc is a proposal and a stepping stone for the development of augmented public spaces that through merging the digital and physical urban layers enable user participation and adaptation in the urban environment. (see Figure 4)

CONCLUSIONS
The aim of this project was to develop what Sennett calls points of disorder, providing opportunities for imagination and spontaneity, by testing the potential of overlapping the digital and physical urban layers. The very dynamic nature of urban public life requires experimentation with creative mechanisms
that engage the community and enrich their experience in urban public space. For this reason, PobleJoc tested open systems and creative points that would leave the space unfinished and offer new possibilities. (see Figure 5)

During its implementation period the PobleJoc installation activated the public space enhancing citizens creativity. Systems merging digital and physical layers should be further tested, but through the PobleJoc installation they demonstrated to be a good starting point for the continuous shaping of urban public space to meet the changing needs of communities.

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